Vol. 20 SEPTEMBER 1934 No. 9

International Journal of Orthodontia and Dentistry for Children

Published by The C. V. Mosby Company, 3523-25 Pine Blvd., St. Louis, U. S. A.

Entered at the Post Office at St. Louis, Mo., as Second Class Matter

International Journal of Orthodontia and Dentistry for Children

CONTENTS FOR SEPTEMBER, 1934

Original Articles

Department of Dentistry for Children

Department of Orthodontic Abstracts and Reviews

The Forum

Editorials

News and Notes

DR. GEORGE B. WINTER

PRESIDENT-ELECT OF THE AMERICAN DENTAL ASSOCIATION

International Journal of
Orthodontia and Dentistry
for Children

VOL. 20 ST. LOUIS, SEPTEMBER, 1934 No. 9

ORIGINAL ARTICLES

TREATED CASES*

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IN CHOOSING the subject of my presidential address I must confess that I found it extremely difficult, if not impossible, to select a subject essentially original, and in consequence I have decided to give you practical details of treatments, and have, therefore, entitled my subject "Treated Cases." Although the title may not convey much originality, I feel sure that some points at least will prove of considerable interest to you. The subject is a practical one, and will be illustrated, so that it will be more in the nature of a demonstration than an address. I am perfectly aware that a presidential demonstration as opposed to a presidential address may seem to some to be unconventional and unorthodox, but of these I crave indulgence. Furthermore I must ask the older members to be especially sympathetic if in the course of my address I appear to be reiterating and trespassing on ground which is not absolutely novel to them but which, nevertheless, may prove to be of considerable and topical interest to some of our younger members present.

Before showing the slides I should like to say a few words about stainless steel. While stainless steel has held a place of high value in general dentistry for some years, its utility as an orthodontic material has only been recognized in recent years. Many obstacles had to be overcome by the pioneers in its adaptation to orthodontics, and only by patience and diligence have these been conquered. The chief difficulty in the past has been the making of an efficient joint between two pieces of the metal without loss of temper, and even today I have yet to see a welding machine which will weld together two pieces of stainless steel without loss of temper in one or other of the pieces. The technic of soldering stainless steel was considerably improved by the introduction of a special flux and a silver solder of very low melting point.

*Presidential Address to British Society for the Study of Orthodontics, January, 1933.

There are two methods of effecting a joint in stainless steel, viz., soldering and welding; both have advantages and disadvantages, and, while not wishing to be biased by the qualities of either, I should like to point out that each method has individual advantages when used in its own sphere. In fact, a soldered and a welded joint may work harmoniously side by side on the same piece of apparatus where two like joints are more difficult to effect. There are two factors which govern the choice of soldering or welding: (1) if you desire

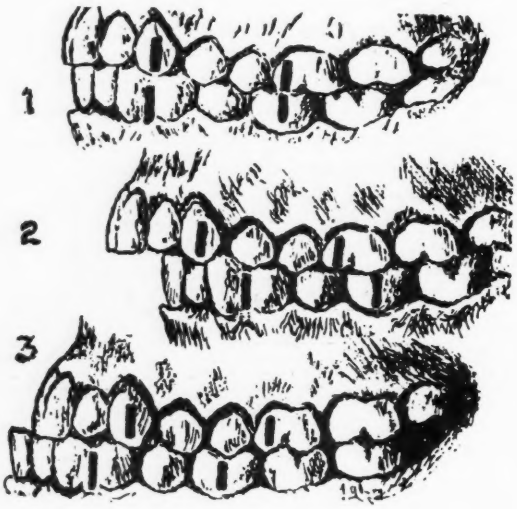


Fig. 1.

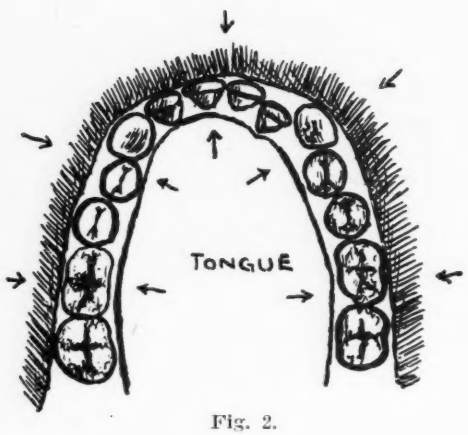


Fig. 2.

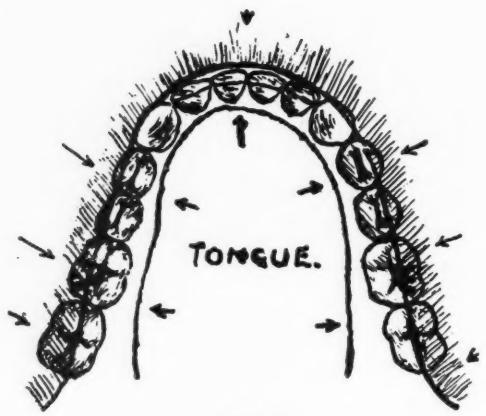


Fig. 3.

to retain temper, soldering is indicated; (2) if, however, as in seaming bands, loss of temper is of no importance, or where two flat surfaces have to be joined, then welding is the better method.

Fig. 1 demonstrates Angle's classification. (1) In the top sketch, which will be familiar to most of you, we have the normal marks; the maxillary molar is slightly distal to the mandibular molar—also note the canine marks. When the molars occlude normally on both sides, the case falls into Class I according to Angle. (2) In Class II the mandibular molar is one unit or cusp distal to normal, and (3) in Class III the mandibular molar is one unit or cusp medial to normal. (Canines and premolars = 1 unit, molar = 2 units.)

I should like for a few minutes to speak of extractions. In Class I the molars being in normal occlusion there is a balance of the units between the arches of each jaw anterior to the molars and when that is the case, if an extraction is performed in one arch there must be another compensating extraction in the other arch if a balance of units is to be maintained. In Class II, since the mandibular arch is postnormal to the maxillary arch, it is sometimes advantageous to remove one or more units from the maxillary arch and none from the mandibular arch. If it is postnormal on both sides, the indication would probably be to remove two units from the maxillary arch and none from the mandibular arch. In Class III the reverse is the case. It may be of advantage to remove one unit or more from the mandible and none from the maxilla.

Fig. 4.

Fig. 2 demonstrates the pressure exerted by the tongue inside and the cheeks and lips outside the mouth. The teeth are in a state of equilibrium in a definite trough between the two opposing forces and are irregular, and as you expand the jaw so as to make the teeth less irregular, they will occupy a wider space and the external pressure will be increased and the internal pressure reduced.

In Fig. 3 the tongue is of the same size as in the previous diagram, but the teeth are arranged regularly, as might be accomplished with an expansion apparatus, so that the tongue does not now exert any internal pressure. The teeth are artificially pressed into the cheeks, and when the appliance which has expanded them is removed, they will very probably relapse and the condition possibly be worse than the original one. By extraction the number of units is reduced, and it is quite possible to arrange a reduced number in the

same trough between the two forces and to have all the teeth in equilibrium and no relapse.

I should now like to say a few words about the soft tissues.

Fig. 4 is of a child aged four years, a thumb-sucker. The pressure of habitually sucking the thumb, probably only at night, has prevented the erup-

Fig. 5.

Fig. 6.

tion of the incisor teeth. My daughter who, when about five years old, used to suck a finger (a habit we could not correct), was later shown this photograph and told that she would not be able to eat a piece of bread and butter if she did not give up the habit. After she heard that, she never sucked her finger again, so it was quite a useful photograph. I have told several parents this story, and they have been successful with the same method. To play on the child's vanity is often much more successful than any appliance.

Fig. 5 illustrates a Class I case, where one tooth only is in front of the lower lip; the other teeth are in normal position. The prominent tooth, of course, will remain there; the lip is holding it forward.

Fig. 6 is a model of the mouth of the same patient showing the prominent tooth.

Fig. 7 shows two incisors forward and the rest normal. Probably the deciduous central incisors were left in too long. They were lingual to the

Fig. 7.

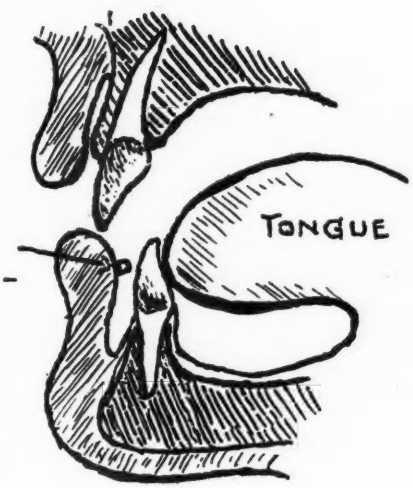


Fig. 8.

permanent central incisors and have pushed them just over the lower lip. The defect is, of course, fairly easy to correct.

I should like special note to be made of Fig. 8. It is a case, again, where the trouble is partly due to the lip. It is a Class I case; the molars are normal. Here the tongue is pushing the mandibular incisors forward; the lower lip normally would hold the maxillary incisors back, but it is underneath the maxillary incisors. The lower lip is now holding the maxillary incisors forward

and the mandibular incisors backward. By fixing bands on the first deciduous mandibular molars and putting a labial bow in front, not touching any of the incisor teeth so as to remove the force of the lip, the tongue acting alone will move the mandibular front teeth forward. In a short time the teeth will touch the bow. The bow is then lengthened and after another short time the lower lip slips in front of the maxillary incisors, and they will move backward,

Fig. 9.

Fig. 10.

so that the regulation has been accomplished without any apparatus touching any of the permanent teeth. Two bands were put on the mandibular deciduous molars and the bow did not touch any other teeth.

Fig. 9 still bears on the action of the soft tissues. This is a Class I case; the molars were normal; the $\overline{|\ 5}$ is unerupted; X-ray pictures show $4\ \overline{5\ |}$ present but impacted, and therefore they cannot come into normal position. The $\overline{3\ |}$ is almost up against $\overline{6\ |}$. The thumb has pushed the maxillary in-

cisors forward and the mandibular incisors backward and caused the impaction of the mandibular premolars. Everything else is normal.

Fig. 10 demonstrates the result of moving the mandibular incisors forward and the maxillary incisors backward, thus allowing $\overline{5\ 4}\ |\ \overline{5}$ to erupt.

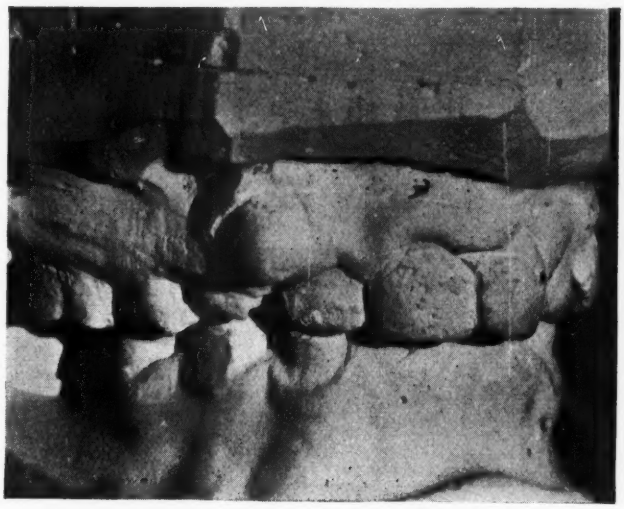


Fig. 11.

Fig. 12.

I introduced this case to show the extreme action of thumb-sucking. The child was twelve years and eight months old when she came to me, and the thumb-sucking effect was maintained by the action of the lower lip. The thumb-sucking initiates the damage by forcing the front teeth into an ab-

normal position and the lip continues the deformity to later years when the thumb-sucking has ceased. In due course, after treatment, the lower lip passed in front of the maxillary teeth and this maintains proper occlusion of the incisors.

Fig. 13-*A*.

Fig. 13-*B*.

Fig. 11 illustrates a case in which the maxillary right molar has been removed at an early age with no compensating extraction in the maxillary arch. The result is that a few years later the $\underline{3}$ | erupts out of the arch altogether and you can note this irregularity on the right side. This displacement is due to the fact that there has been one maxillary extraction with no compensating extraction from the maxilla. The left side of this patient is normal.

Fig. 12 is an occlusal view of the same two models. The $\overline{6}$ | was extracted and the $\underline{3}$ | is outside the arch.

Fig. 13*A* and *B* show a comparison of the right and wrong ways to proceed. A child consults the dentist with a faulty tooth, and he says, "Oh, we'll have it out"—no further explanation. The $\overline{6}\,|$ is taken out and the $|\,\overline{6}$ has been taken out soon afterward. At this stage it is a Class I case. The models in *A* show the case a few years later. The spaces are nearly closed up and the front maxillary teeth are crowded out owing to the extractions from the mandible only with no compensating extractions from the maxilla. The *B* shows the result of symmetrical extraction. It is difficult to persuade parents to allow a good tooth to be taken out, but if they are shown a comparison such as this and are told that if they do not have the tooth or teeth taken out as well as the mandibular, then *A*, viz., overcrowding, will be the result in a few years' time, and if they do allow the compensating extractions to be

Fig. 14.

made, *B* will be the result; viz., the front teeth in good occlusion and the spaces nearly closed up (and as time goes on they will entirely close up). With this comparison before them they are generally convinced and agree to the correct extractions. In order to overcome this difficulty I have had printed a number of postcards of Fig. 13*A* and *B* to persuade parents to allow extraction when it is indicated.

Fig. 14 is a photograph of the same patient as in Fig. 13*A* and demonstrates the disastrous results of taking out the mandibular molars and not the maxillary molars. The patient's appearance was marred by the asymmetrical extraction, and she is now a case for the orthodontist.

In order to overcome the necessity of taking two separate photographs, one full face and one profile, I now place a mirror at an angle of 45 degrees at the side of the patient's head, which enables me to get two views from one exposure—one direct, and the profile by reflection in the mirror.

Fig. 15 is a Class I case in which the molars are quite normal, but the incisors are overcrowded, and we have to decide which teeth are to be extracted. I have found that it is generally advantageous to remove the maxillary first and mandibular second premolars. Fig. 15*B* shows the result (right side) nine months after extraction without the use of any apparatus. The maxillary premolar which remains in the arch is definitely distal to the

Fig. 15-*A*.

Fig. 15-*B*.

mandibular premolar. No apparatus at all is required to obtain this result (15*B*). The canines fall into position, and the effect is quite good.

Fig. 16*A* shows the same model on the left side. On this side, unfortunately, the second premolar in the maxilla was carious. Since it is a pity to take a good tooth out when there is a bad one next to it, which would have to be filled in any case, it was decided here to take out the two second premolars instead of the maxillary first and the mandibular second. Fig. 16*B* shows the result obtained without any apparatus nine months afterward. It

is not nearly so good as the other side, and it now requires apparatus to ensure that the maxillary premolar shall occlude distal to the mandibular premolar, otherwise there is a danger that the maxillary will slip forward and remain anterior to the mandibular.

We all get cases of maxillary incisors articulating inside the mandibular. A simple method of dealing with this defect in the early stages is by means

Fig. 16-*A*.

Fig. 16-*B*.

of a plate with retention bands on the deciduous molars and a lingual steel wire to push the incisor over. It may be necessary to put a pinch band on the incisor with a little spur at the back to make the plate more stable. This spur prevents the spring wire from sliding down the lingual surface of the incisor. (Fig. 17.)

With a spring a gentle continuous pressure is obtained, obeying physiologic conditions, and the result is better than using a hickory peg or a screw,

and the appliance is much more comfortable for the patient and more easily adjustable for the orthodontist. One detail that I might mention about these plates with stainless steel wires in them is that there is no adhesion between

Fig. 17.

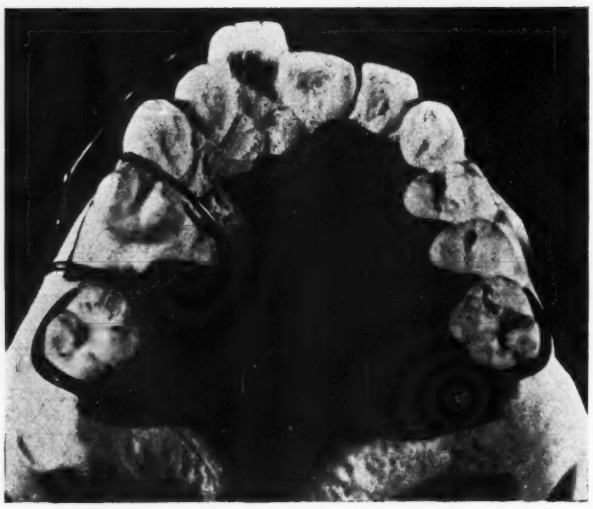


Fig. 18.

steel and vulcanite, so that it is absolutely necessary to get a mechanical hold. The wire must be bent into a loop in the vulcanite to obtain good retention. D-shaped wire used for clasps, etc., is best secured by cutting notches in the buried portion.

Fig. 18 illustrates the case of a girl aged eighteen years, who was proceeding to France to learn the language and objected to her appearance caused by the marked protrusion of $\underline{1\,|}$ the result of an early extraction in the mandible with none in the maxilla. As she was older than usual and proceeding abroad I thought it was better to play for safety and take out $\underline{5\,|}$. I made a plate with a spring wire pressing $\underline{4\,|}$ backward; I passed another

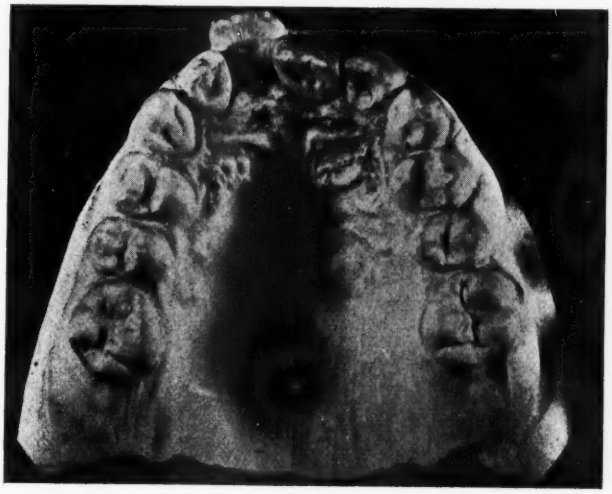


Fig. 19-*A*.

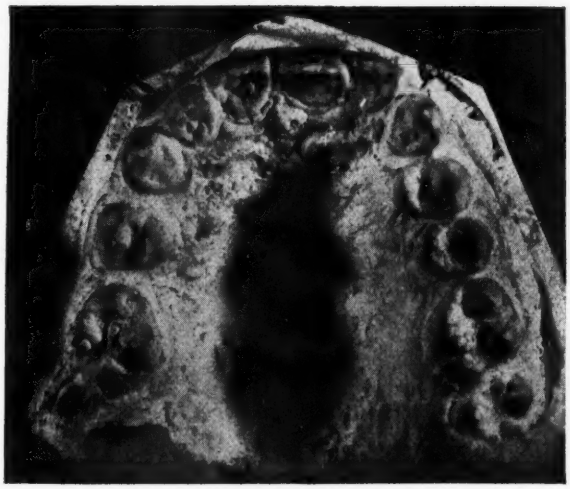


Fig. 19-*B*.

wire through the gap made by the extraction of $\underline{5\,|}$ labially, and pressing on the $\underline{1\,|}$. She then went to Paris for six months.

Fig. 19A and B show the comparison of this case before and after treatment. The result was obtained in six months without attention from any dentist while she was away from home. The gap is practically closed up. It would probably have been all right if I had taken $\underline{4\,|}$ out.

Fig. 20 is a Class II case. The canines have not erupted, and the illustration shows the view from the back of the mouth and how the mandibular

teeth are biting right on to the hard palate. This was treated by a type of plate designed by Mr. Visick.

Fig. 21 shows a vulcanite plate made with four strong half-round stainless steel spurs in front. The first premolars are extracted and a labial bow wire with loops for adjustment passes out through the spaces created by the extractions. The maxillary incisors are pulled backward by the labial bow, and

Fig. 20.

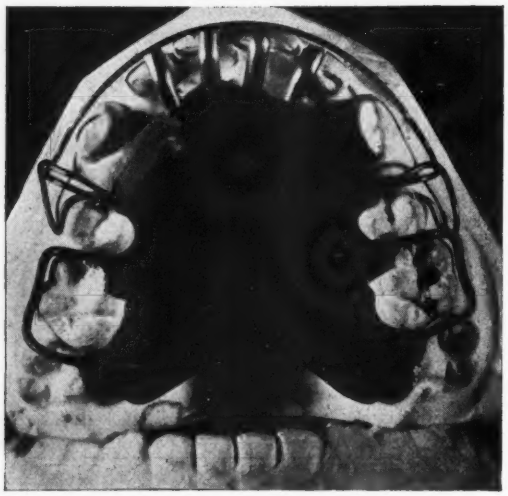


Fig. 21.

there is also an inclined plane on the plate to press the mandibular incisors downward and forward.

Fig. 22 shows the back view of the mouth, again with the mandibular incisors depressed and well off the hard palate.

Fig. 23 is a diagrammatic view of the action of the Visick plate. *A* is a vulcanite plate with spurs in front; *B* is a labial bow which can be pulled backward by tightening the loops. The patient bites up and that pushes the

mandibular teeth forward and depresses them. The spurs must be bent upward in order to take the pressure of the plate off the hard palate, so that all the force of the bite is transmitted to the edges of the maxillary incisors and shortens them. The angle to which the teeth occlude or bite on the wire is very important. They must bite about at *C*, so that the upward pressure

Fig. 22.

Fig. 23.

of the inclined plane pulls the maxillary teeth lingually. Each time, therefore, that the patient comes for adjustment the spurs are bent upward and adjusted so that the maxillary teeth bite on that part of the spur which is inclined backward and downward. After the plate has been worn for three weeks or so, the teeth will have moved backward, then the spurs are shortened and bent up. It is constantly necessary to reduce the vulcanite on the lingual side, because room must be made for the teeth to move backward. The ad-

justment, therefore, is made by cutting vulcanite away, shortening the spur wires, bending them up and tightening the loops on the labial wire. Children must be instructed to eat with the front teeth because the molars do not quite touch. This allows the molars to erupt a little more and thus helps in opening the bite.

Fig. 24 is a Class II case—distoclusion of the mandibular molars—an early thumb-sucker. Notice particularly the extreme space between the maxillary

Fig. 24.

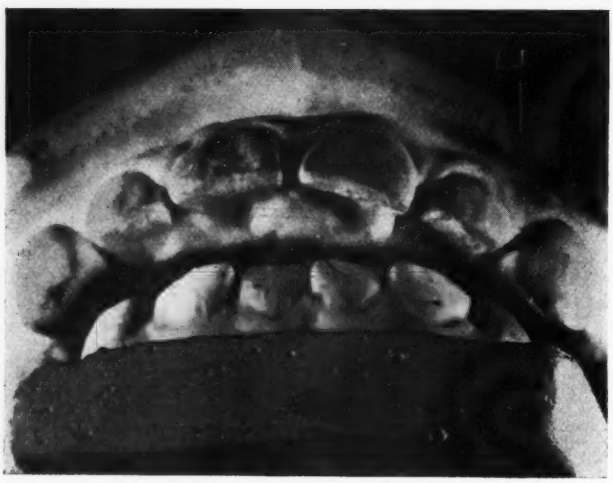


Fig. 25.

and the mandibular incisors. The lower lip is hidden by the maxillary teeth and the expression of the child is entirely spoilt by the maxillary teeth protruding in that fashion. The overbite was reduced entirely by wearing a Visick plate for three months.

Fig. 25 shows the mandibular teeth not biting on the hard palate, and it is easy to move the front maxillary teeth backward since there is no obstruction. After three months the maxillary first premolars were extracted and a stainless steel maxillary bow was inserted labially.

Fig. 26 shows the passive position of the bow. The bow is arranged in the tubes on the molars so that its passive position is at the junction of the lower and middle third of the crown. The bow is sprung downward and pushed backward at the same time, so that the four hooks clip the incisive edges of the four maxillary incisors. The upward pressure will shorten those teeth.

Fig. 27 is a side view of the same case. The loop finishes at a point which allows the bow wire to be pulled a limited distance. *A* is an intramaxillary hook; a rubber band over this hook and also over the buccal tube on the

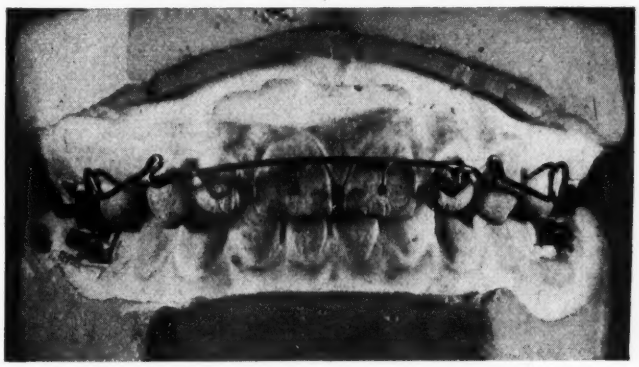


Fig. 26.

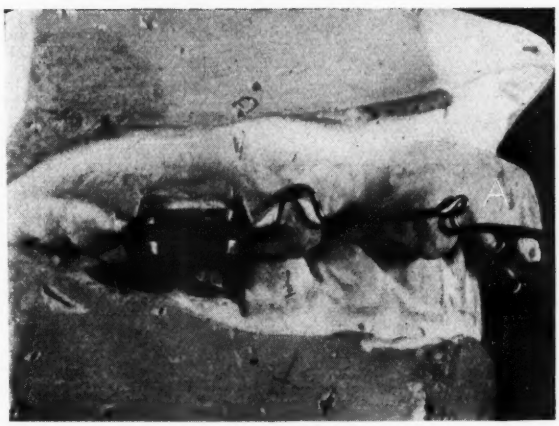


Fig. 27.

molar band pulls the whole bow backward, pulling the maxillary incisors with it, but they are also shortened, since there is an upward spring on the front of the wire. This tends to tilt the molars backward and gives stationary anchorage. The molars cannot tilt forward because of this spring. At each visit it is important to see that there is actually an upward spring in front. As soon as the bow has moved distally until the loops touch the tubes the action ceases. It is then necessary to close the loop up to shorten the wire.

Fig. 28 is an occlusal view of the same case, showing the little hooks on the incisors. Intermaxillary traction may be used if thought necessary by putting a rubber from the intermaxillary hook on to a spur on the band of

the mandibular molar. The mandibular lingual wire stabilizes the molar and slightly pushes the mandibular incisors forward.

Fig. 29 shows the result; the maxillary front teeth are now touching the mandibular teeth; the lip cannot get underneath the maxillary teeth and the incisive bite is quite normal.

Fig. 28.

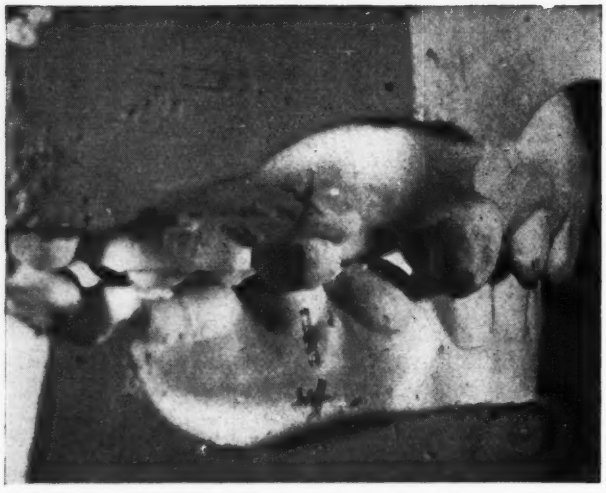


Fig. 29.

Fig. 30 is the profile of the patient after treatment. By the way, in my early days I did not photograph all my patients to start with, and that was a great mistake. Quite a number of photographs in this series have been obtained from parents, and were taken several years before I started treat-

ment, so if you think that the photograph before treatment shows a young child and the final photograph shows a much older one, do not think that it is because the treatment has been going on for a long time. It is because I did not photograph them at the start.

Fig. 30.

Fig. 31.

Fig. 31 is another photograph taken some years before I started treatment. It is enlarged from a little snapshot which the parents lent me. Notice the condition of the teeth; the four incisors are well over the lower lips; possibly the lower lip is rather short.

Fig. 32 shows the models. The lower lip is under the maxillary incisors, which are forward and the mandibular incisors back. X-ray pictures show that $\overline{|\ 2}\ 5$ are congenitally absent, or possibly extracted by some unknown dentist when the deciduous teeth were taken out.

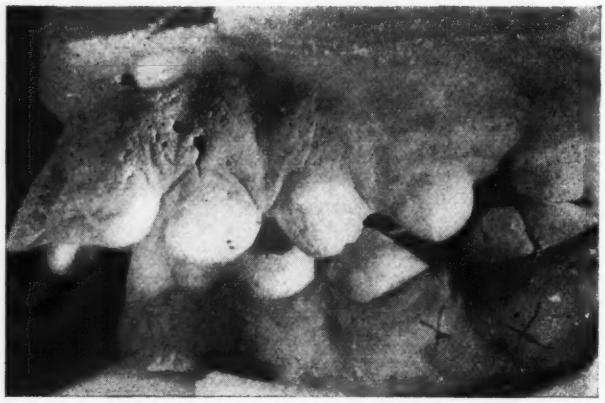


Fig. 32.

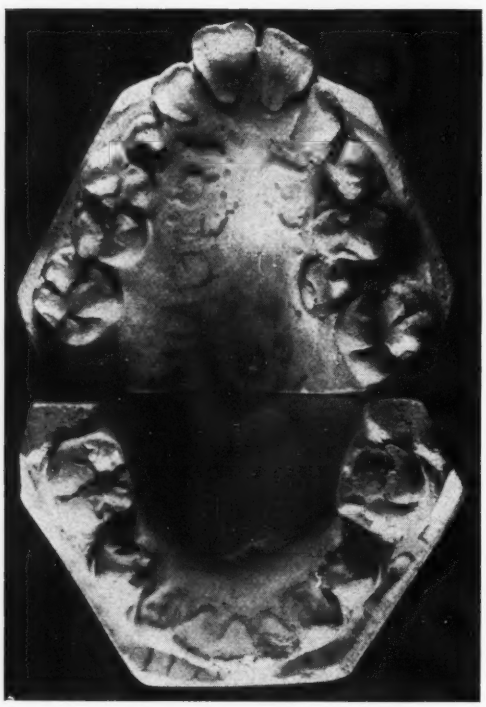


Fig. 33.

Fig. 33 gives an occlusal view of the two models. It is a case of balancing up by extractions before treatment is started. In the mandible $\overline{5\ |}$ does not show but it is present, and every effort must be made to get it to erupt. As the mandible is too small it is desirable to increase the size; in the maxilla, room is greater; the molars are normal. I decided to take two premolars out

in the maxilla, as there were already two units missing from the mandible, so that would balance up. Fig. 34 shows the results after nine months' treatment. Fig. 35 is the profile after nine months' treatment.

Fig. 36 is an early photograph of another very similar case, only here, when presented, there were two mandibular teeth already extracted instead of being congenitally absent.

Fig. 34.

Fig. 35.

Fig. 37 shows the teeth protruding in front. $\overline{5 \mid 6}$ were extracted before the patient came to me; as a result the mandibular front teeth have fallen back and the lower lip now passes lingual to $\underline{21 \mid 12}$. I had to take some maxillary teeth out, and this shows the extraction of $\underline{4 \mid}$. The other side is the same.

Fig. 38 shows the condition to date. The maxillary incisors are retruded and the mandibular aligned quite nicely. The teeth are well inside the lips and the profile (Fig. 39) is quite good.

Fig. 40 is quite a different type of case. 1 | 1 central incisors are very much in front of 2 | 2, and the space is not quite wide enough for 1 | 1. There is a tremendous incline, almost 45 degrees of 1 | 1.

Fig. 36.

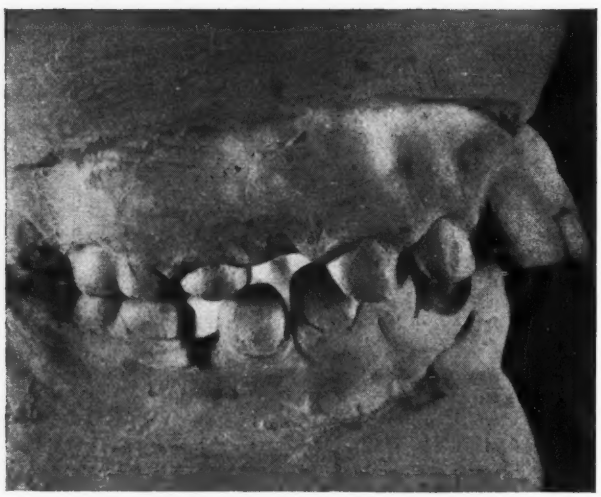


Fig. 37.

Fig. 41 shows the condition of the mouth at the time of starting treatment. It is a Class II case, and again we extract 4 | 4.

Fig. 42 is a diagram in which I have tried to show the forces which have brought about the correction. It is a very important diagram to follow, and if those who do not already know it will follow it, they will find it very useful. There are pinch bands cemented on the two maxillary central incisors, carry-

ing D tubes vertically on the labial surfaces; the lower picture shows a D tube. The stainless steel wire is very thin and delicate, being only 0.5 mm. thick. It is bent so as to fit accurately into the D tube, and the method of fastening it is to thread a soft ligature wire through the loop at the top, bring each end round the back of the bow wire and tie it at the bottom. In practice it is pulled quite tight; the ends are cut off rather long and bent up behind the two limbs of the labial bow wire, where they do not injure the

Fig. 38.

Fig. 39.

soft tissues. The method of adjustment is as follows: The wire is adjusted so that its passive position is shown by a dotted line, and when sprung up into the buccal tube on the molar band it will rotate incisors round a horizontal axis about *A*, so that the incisive edges move lingually. The roots tend to go labially, but that does not happen in practice, because there is also an intramaxillary rubber from the hook B, round the back of the tube on the molar band. That rubber pulls the maxillary central incisor bodily back-

ward, as indicated by the two arrows *c c*. The wire has been sprung up from its passive position, so that the downward force thus created tends to elongate the molars, which has an advantage in reducing the overbite, and the reactive upward force shortens the incisor. That is another favorable force. The end of the wire is bent at a good angle so as to give the molar a good tilt forward

Fig. 40.

Fig. 41.

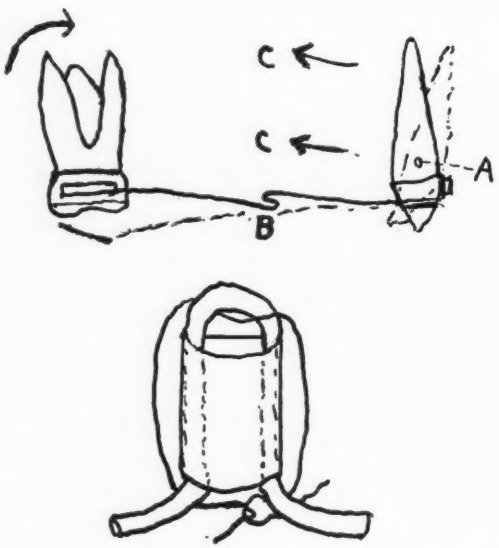


Fig. 42.

at the roots, so that the crown is being tilted backward. This gives it stability and enables it to stand the force pulling it forward exerted by the intramaxillary rubber and gives stationary anchorage. Every force with the exception of the pulling forward of the molar, is favorable to the correction, and there is practically no movement of the molar if the adjustments are correctly made. It would be impossible to push the bow wire in the molar tube,

as the diagram shows. In actually fitting the bow, after it has been adjusted, the ends are passed into the molar tube first and the loops are slid into the D tubes afterward.

Fig. 43 shows the result after fourteen months' treatment.

Fig. 44 is a photograph showing teeth well inside the lips. The patient has now a mouth-screen to wear at night in order to make sure that the position is maintained.

Fig. 43.

Fig. 44.

Fig. 45 is that of a boy who has fallen down in the schoolyard and broken off half the maxillary incisor. We all get such cases as the result of accident. The nerve is exposed and he will either have a dead crowned tooth all his life, or it must be extracted. I decided to take it out. The apparatus fitted was very simple; he wore a mouth-screen (Fig. 46) for nine months, simply a piece of vulcanite made to fit the front of the mouth inside the lips. The method is as follows: occlude the two models, place a piece of modelling wax over

Fig. 45.

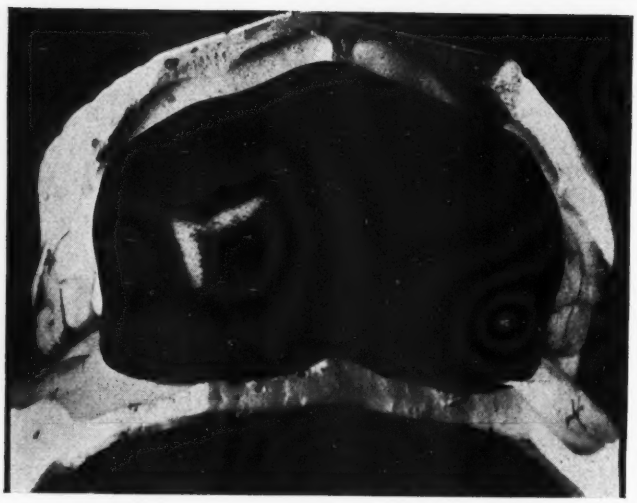


Fig. 46.

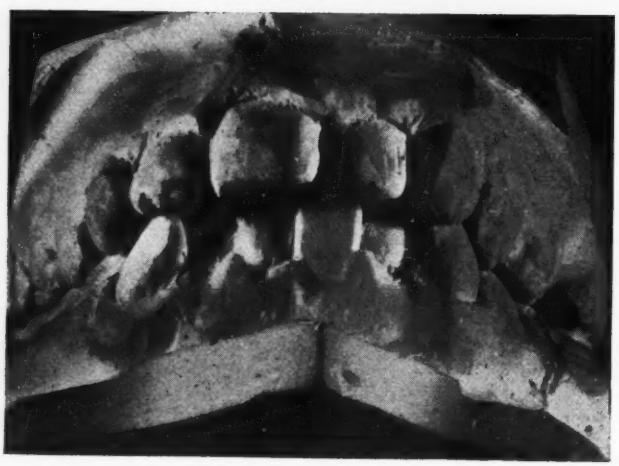


Fig. 47.

the area to be covered, which should be from the front edges of the molars at the sides and as large in front as possible without injuring the soft tissues. Put plaster on top, and when it is set, remove the models and add a little wax in the depression made by the most prominent teeth, so as to spoil the fit and make the plate rock on these prominent teeth. In this way the pressure of the lips is transmitted to these teeth. In three weeks or so the

Fig. 48.

Fig. 49.

prominent teeth will have moved backward and the plate will have ceased to rock. It is then necessary to make the plate rock again and this can be done easily by drilling holes in the plate in the desired positions and inserting pieces of rubber about 2 mm. square in the same fashion as the old hickory peg, but rubber is easier and quicker than the peg. After the teeth have moved backward still more, it may be an advantage to make a new plate in order to get a better fit to the front teeth and to allow of the use of shorter

Fig. 50.

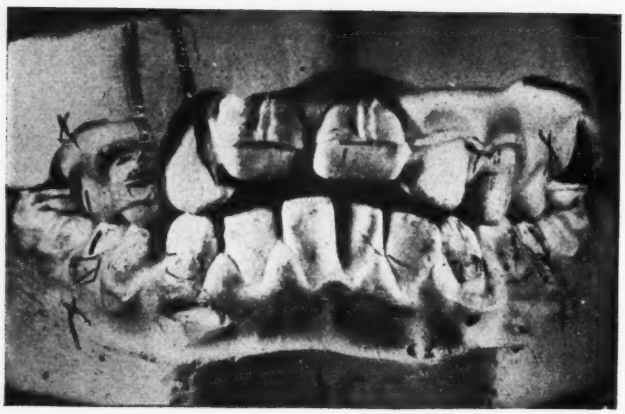


Fig. 51.

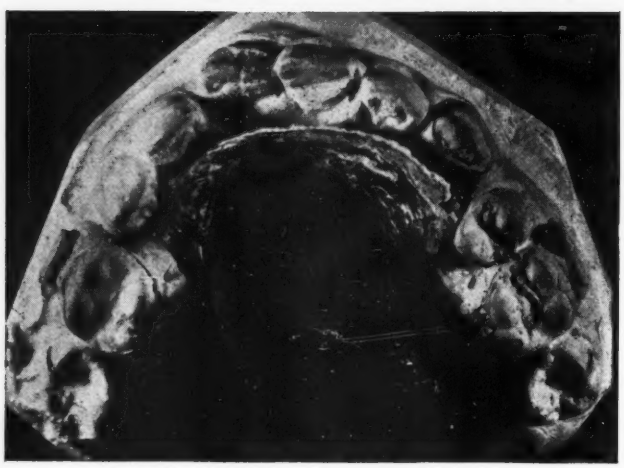


Fig. 52.

pegs, and also to enable the lips to assume a more natural position. Fig. 47 shows the result after wearing a mouth-screen only at night for fifteen months.

You see that the central incisor is missing, but I think that the result justifies the extraction.

The next case serves as a warning to dentists who have patients referred to them for extraction by the orthodontist. The four first molars were found to be quite unsavable—decayed almost down to the gum. I therefore sent the patient back to his dentist, asking him to remove the first four permanent molars. While the patient was under the anesthetic the

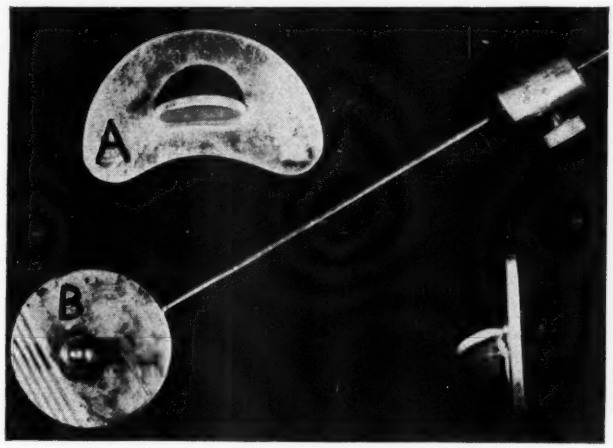


Fig. 53.

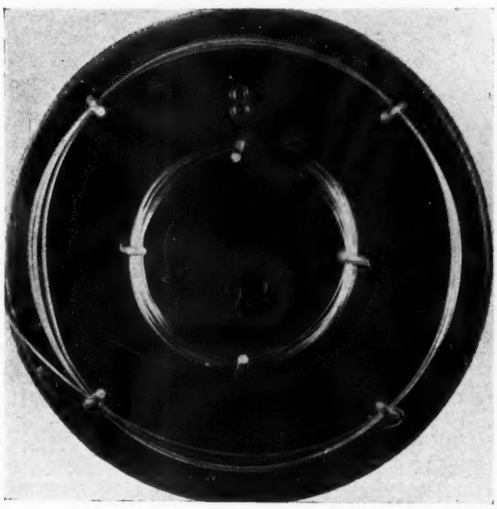


Fig. 54.

dentist said: "I'll take all the deciduous teeth out as well." Fig. 48 shows the condition when the case was referred to me. Later I found I had nothing to work on. However, I put a screen in, as in the previous case, to be worn at night, and the improvement, as shown in Fig. 49, is very marked. The premolars are now erupting in almost normal occlusion. This is just to illustrate what a tremendous force a mouth-screen has and how useful it may be in certain cases. It also prevents mouth-breathing.

Fig. 50 shows a case that baffled me very much, and I should be glad to hear the opinion of some of the senior members on it. Why is 1 | short? It looks very simple, and as though 1 | is impacted owing to the converging crowns of 2 | and | 1. 3 | is just lingual to 3 | , so I moved 3 | labially and fitted a maxillary bow anchored to eight or nine teeth and succeeded in moving all the anchor teeth (Fig. 51), but 1 | did not come down. This baffled me very much. Then I discovered that the child always bit a pencil when she did arithmetic. No apparatus can combat the force of a bite on a piece of hard wood like a pencil. I obtained the mother's and child's promise that she would not go on biting her pencil; I took all the apparatus off and in a little while she got out of the habit. The anchor teeth very nearly returned

Fig. 55.

to their previous positions and still 1 | did not erupt further, although there was plenty of room. An x-ray picture shows that 1 | has a straight root. The conditions were apparently very favorable for it to erupt, but still it did not. Then I noticed a little thing like a cherry sticking out of the month; it was the tongue pushing out under the incisive edge of 1 | when the child was not thinking of it. I am convinced that the tongue is now the cause of that tooth not erupting, so I made an occlusal plate (Fig. 52) with a flange arranged lingually, which prevented the tongue from protruding into the space where that tooth requires to erupt. I have taken very careful measurements over a few months, and the tooth is starting to erupt by natural forces since the tongue has been screened away. I will report later on, but I have hopes of getting the tooth down by removing the forces which held it up; first the pen or pencil, and then the tongue.

I think that Dr. Friel invented the aluminum disc shown in Fig. 53*A*. He calls it a "reminder." When the maxillary teeth have been moved back sufficiently to allow the lower lip to pass in front of them, it is very important to cure any lip-sucking habit which might bring about a relapse of the teeth. If the child is reading a book or not talking, and when there is no reason why she should not wear it, she grips this aluminum disc between the lips. It

Fig. 56.

Fig. 57.

Fig. 58.

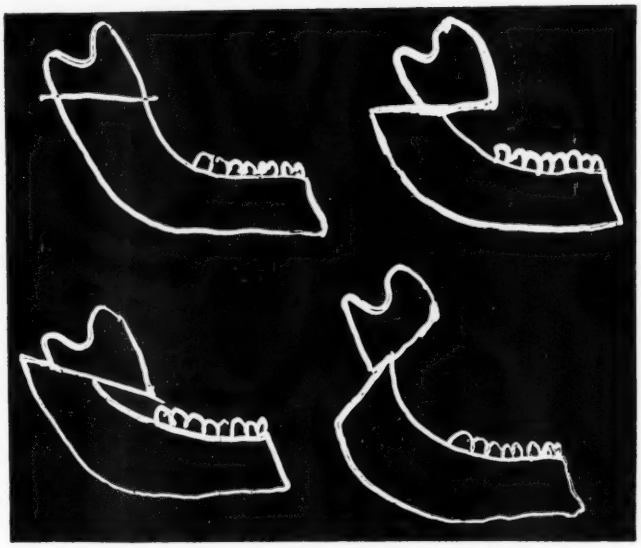


Fig. 59.

becomes a habit, like smoking a cigarette; I have tried it and quite like it. It makes you breathe through your nose and is very light and easy to hold, and quite a good thing to wear simply as a maintenance device after the teeth and lips are in normal relation.

Fig. 53*B* is an appliance by which, by moving the weight along, you can test the strength of the lips. Very often children cannot hold it with the

weight entirely off, but after a time and with exercise they will hold it with the weight at the end.

Fig. 54.—Those of you who have been using stainless steel wire will find it is difficult to keep tidy in a drawer. Much time is wasted in winding the coil up again each time you cut a piece off. A most useful form of wire holder is shown in Fig. 54; it is just a piece of wood with four bent screws put in and the wire coiled inside them. When you want a bit off, you unravel sufficient, cut it and the rest remains intact. The device keeps the wire tidy and prevents it from getting kinked, and also allows it to be stored flat in the drawer.

Fig. 60.

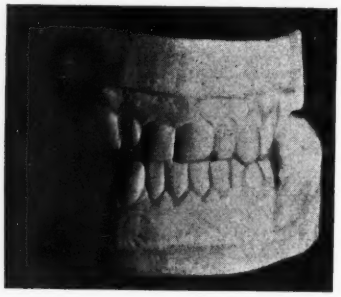


Fig. 61.

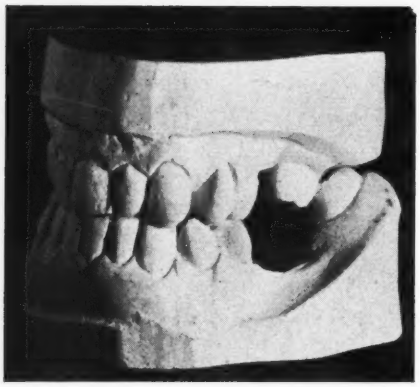


Fig. 62.

Fig. 55 is a Class III case I am showing for the benefit of those who have not seen it. A man, aged twenty-eight years, had his mandibular incisors 17 mm. in front of the maxillary incisors.

Fig. 56 is the condition (right side) when he first attended. The model is articulated on an articulator.

Fig. 57 is a front view. The only points of occlusion are in the molar region, one spot on each side. He could hardly masticate and was almost demented, and his speech was not good.

Fig. 58 shows a sketch of the silver splint that was made. A trough of silver was cast for the maxillary and for the mandibular teeth. Nearly all the teeth were present and in very good condition, which was remarkable,

considering that they were mostly functionless. Several small hooks were soldered to each splint, and the splints were cemented on the teeth the day before the operation. Mr. G. E. C. Simpson of Liverpool sawed each ramus through below the sigmoid notch and above the mental foramen, leaving the arteries and nerves intact.

Fig. 59 shows the result of making the saw cuts at different angles. In this case we wanted to lengthen the rami, so they were sawn backward and downward.

Fig. 60 shows occlusion (right side) after the jaw had been pushed back.

Fig. 61 is the front view, Fig. 62 left side.

Fig. 63.

It might be interesting just to say a few words about the operation itself. It was all done from the outside; an aseptic operation was carried out without a spot of blood entering the mouth. A small incision was made about half an inch long, the position being ascertained by palpation and x-ray examination (just a slight cut to get through the skin). The facial nerve is very near, and there is danger of severing it. A blunt instrument was pushed up to the posterior border of the ramus (Hilton's method), the periosteum was cut and a periosteal elevator was pushed along the deep surface of the ramus. Directed by that elevator, a small saw was introduced, and the bone was sawn from within outward—not quite through, because the parotid gland and the facial nerve are on the outer side of the bone. When it was nearly sawn through, a chisel was inserted and the division was finished with about two knocks. The bone was, therefore, cut through from inside outward without any injury

to the facial nerve. The other side was done the same way. The mandible was pushed back and wired to the maxilla with tinned copper wire, gauge 24. The patient was left with the mandible fastened to the maxilla for six weeks; he was fed through a glass tube through the gap left by the previous loss of a molar. If the gap had not been there we should have had to take the tube round the back. The bony union was quite good but there was poor occlusion as the mandibular teeth had never been in natural contact with the maxillary teeth. A little articulating by grinding, however, brought about the result shown in Fig. 63, which is the profile after the operation.

My thanks are due to Prof. W. H. Gilmour, Mr. H. Bernard Concanon, and Mr. L. Parsons for help in preparing this address, and to Mrs. Lindsay for operating the lantern.

DISCUSSION

Mr. A. L. Packham, in proposing a hearty vote of thanks to the President for his presidential address, said that it would not be difficult for any member to imagine the labor which Mr. Watkin had put into its preparation. The President had, continued Mr. Packham, given a demonstration of what could be done by a method well known among orthodontists: a combination of extraction and appliances. Every member would learn a great deal from the numerous cases that had been shown and the ingenuity which had been applied in some of the methods of bending the stainless steel wire and using the reciprocal and interacting forces.

FACIAL-DENTAL CASTS AND RECORDS*

A Preliminary Report

Herbert I. Margolis, D.M.D., Boston, Mass.

THE purpose of this paper is primarily to present in as much detail as time will permit a technic for the construction of dentofacial models and the development of recordings or maps of the dentition in such a manner as to permit accurate comparisons, thereby affording a means of determining changes resulting from growth or orthodontic interference of any part of the dentition in three dimensions.

The principle element of any technic having a similar purpose is accuracy. Obviously the value of results obtained is directly proportionate to the accuracy employed. With the technic to be presented, if properly carried through, complete records of the entire dentition of a child can be constructed and compared with similar later records with negligible error.

Undoubtedly every one here is familiar with the work being done in the same field by other men. There are two general methods of approach: cephalometric and craniometric. In one case the landmarks from which planes are constructed are obtained directly from the soft tissue on the living subject, and the term applied to this system is that of cephalometrics. There are two means for obtaining these points: one method is the obtaining of these points on facial casts. This technic was developed by Van Loon. His work on the construction of facial casts with dental inserts has been a source of inspiration to many investigators who followed him. The other cephalic method is the palpating with finely graduated instruments the desired landmarks on the face or head. These points are transferred to a model of the maxillary arch. The operator hopes to approach the same landmarks at different intervals. Simon's contribution in cephalometrics has had a profound and valuable influence on the concept of occlusion and its variations.

The second general approach is by means of craniometric landmarks. Anthropologists who have interested themselves in the growth and development of the human dentition have made their measurements directly on skulls. In America we are all familiar with the work of Gregory, Hellman, Todd, and Hooton. Holly Broadbent is the outstanding contributor of the craniometric technic on the living. In his radiographic technic the subject is set up by cephalic landmarks, but the points from which his planes are established are all taken from the cranium. It is not essential to enter a discussion of the

*Presented at the Thirty-Second Annual Meeting of the American Society of Orthodontists, Oklahoma City, Okla., November 8-10, 1933, and at the Twenty-Fifth Annual Meeting of the Eastern Association of Graduates of the Angle School of Orthodontia, New York City, May 7-8, 1934.

methods employed by these investigators in obtaining planes necessary for their technics. These are either well known to you or are available in their writings.

May I, however, name the landmarks that are employed in this technic and the planes constructed from them. Two points are obtained from the tragia not directly from the child's face, but from a model of these areas obtained from a plaster impression. In other words, a needle is not placed on the ear of the patient but an impression is first taken of that area, a model made, then two lines drawn, at the intersection of which a point is indicated. The two points of the tragia are cephalic points. The third or anterior landmark is the nasion, also indicated on the model, which has similarly been constructed from an impression of the nasion area of the face. This point, however, is not a cephalic point, since it is not obtained on the integument or skin of the subject but is a cranial point marked on the model in the relative anterior and vertical positions where it would be on the skull of the child, or, to be more accurate, is a projection of the point on the sagittal vertical plane of the model. The nasion point is obtained from either a profile or nasion radiograph, the technic of which will be described later.

To recapitulate then, the three points are: one on each tragus, cephalic points, and one on the nasion—a cranial point. Therefore, I should like to refer to the plane passing through these three points as the craniocephalic base. The triangle formed by these three points is then the craniocephalic triangle of this technic.

I shall now describe the three planes that are established by means of these three points and upon which projections are made. The model is oriented about the tragial axis so that the nasion of the craniocephalic base inclines upward to form a 15 degree angle with the horizontal. Our horizontal plane is, therefore, that plane passing through both tragia and making a 15 degree angle with the craniocephalic base. Upon this plane are projected the occlusal aspects of the dentition. The second or the sagittal vertical plane is one perpendicular to, and bisecting, the bitragial line. Upon this plane are constructed the vertical maps of both sides of the dentition. The third plane, the transverse plane, is one passing through the bitragial line and is perpendicular to both the horizontal and the sagittal vertical plane. These three planes are established on the model by means of the apparatus described later.

You will notice in the technic that will be presented a little later, the following factors: First, when the three points are established on the model, a permanent record of them is obtained to which the operator can always refer. Second, when the model is set up according to these three points on the relating table, a piece of machined brass is affixed to each model thereby establishing the three planes on that model in an unalterable position to the projecting instrument. Third, it is possible to replace the model on the relating table by means of this brass metal appendage and check back on the original set up so that a variation of these three points from their original position can be noted to a fraction of a millimeter and corrected.

Before proceeding with the description of the technic employed, I should like very briefly to indicate the work I have been doing since 1923 which will enable me to present more clearly the present technic. During that year I watched Dr. Joseph Eby in his own inimitable way make a facial impression from which he constructed a facial cast. I was rather impressed with this cast and dental insert because it seemed to me a very spectacular and inclusive picture. I made about fifty of them. (Fig. 1.) I published an article in the INTERNATIONAL JOURNAL OF ORTHODONTIA, March, 1925, "An Improved Technic for Making Facial Casts With Dental Inserts." The next series of facial

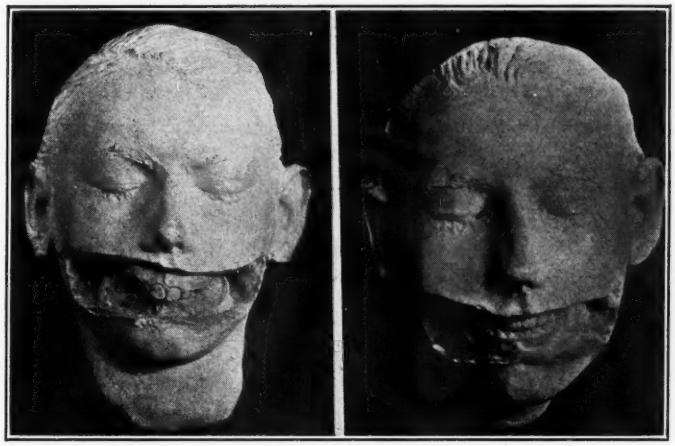


Fig. 1.—Facial casts with dental inserts. Before and after treatment.

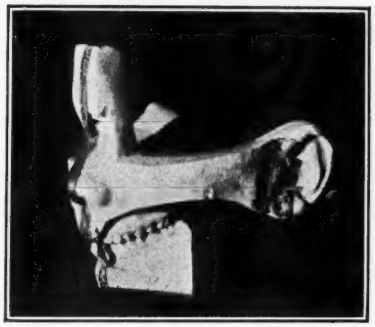


Fig. 2.—Skeletal facial cast with dental insert. Profile and dental areas of metal.

casts that I made included only the profile of the patient and ran along the cheek and included the ears, with dental inserts. (Fig. 2.)

After having made a number of these facial casts, my objective was twofold. First and foremost was to reduce the strain on the patient. This has been accomplished. The amount of time necessary for the child to be in the chair is no longer than from twenty to twenty-five minutes. There is no hardship to the child, as the amount of facial areas covered is about 3 sq. in., one inch over each ear and about one square inch on the bridge of the nose.

The second objective was to reduce the amount of laboratory work involved. It takes about two and a half hours in the laboratory to construct the following records: first, a set of dentofacial models; second, three enlarged maps of the dentition, namely one occlusal view and two lateral views.

Included also with our records is a profile x-ray picture from which we have a profile outline of the face and underlying bones of the skull and face.

The technic for obtaining the aforementioned results can be divided into two phases: first, the operative work which includes the taking of the profile x-ray picture and dentofacial impression; and second, the laboratory phase which includes the construction of the model, setting up of the model and the development of the maps.

The profile radiograph and the dentofacial impression must both be taken at the same sitting; therefore, I shall describe first the technic for taking the profile radiograph. A piece of metal of known length is placed on the bridge of the nose by means of liquid adhesive and further positioned by adhesive tape. This will be referred to as the nasion locator. The child is seated in

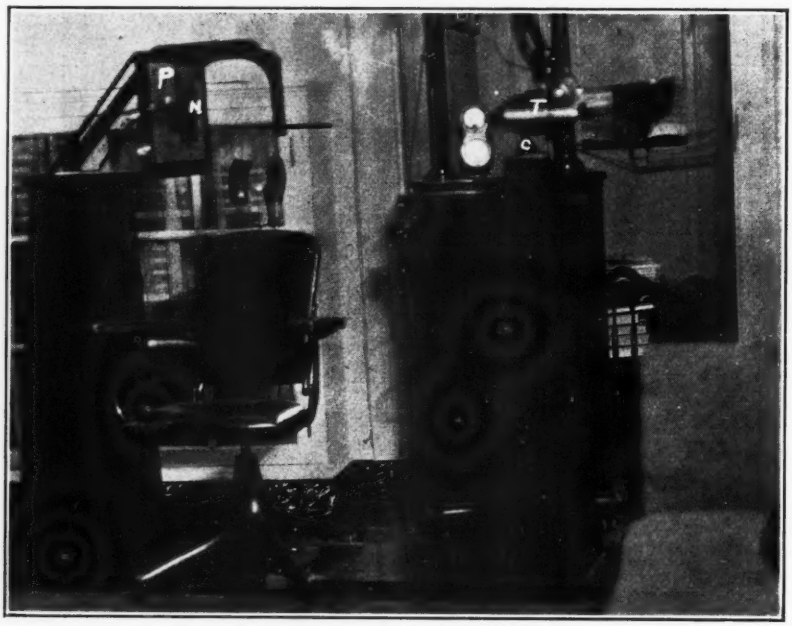


Fig. 3.—X-ray apparatus. C, casting for insertion of x-ray cone; T, telescope; N, cassette for nasion area x-ray (2 x 3 in.); P, cassette for profile x-ray film.

the x-ray apparatus (Fig. 3) which as you see permits the placement of the child's head at one end. The x-ray cone fits into a casting (c). There are two interesting features to note about this apparatus: first, the telescope (T) which enables us in a few seconds to direct the central ray through the center of the ear rods. Second, the slide which contains a 2 by 3 inch cassette (N), on which is obtained an x-ray picture of the nasion locator, and nasion of the skull. This cassette is in an adjustable slide so that it is always a given distance from the nasion locator in as proximal a position as possible. There are obtained therefore two x-ray pictures, the profile x-ray and a nasion relator x-ray picture. The profile x-ray picture is very accurate and allows for comparative study. For the present technic, however, the only point of interest is to locate the nasion with relation to that nasion locator. (Fig. 10*A*.)

The child is now ready for the dentofacial impression. It is important to note that this nasion locator remains in the same position on the face and

will therefore come out on the bridge of the nose as a part of the model. The reason for it will be clear when the nasion is located on the model later. (Fig. 4 L.)

The dentofacial model consists of the maxillary teeth and three facial areas as previously mentioned: the two tragial areas and the bridge of the nose. In order to obtain this impression, a tray is necessary (Fig. 5). This tray is a precision instrument and consists of two divisions, a dental cup (D) and three adjustable appendages (T, N, T).

A pledget of cotton is placed in each ear hole. A small mix of impression plaster is prepared and painted in the concha of each ear covering the tragus completely and about one-quarter to one-half inch of the helix. Also, with

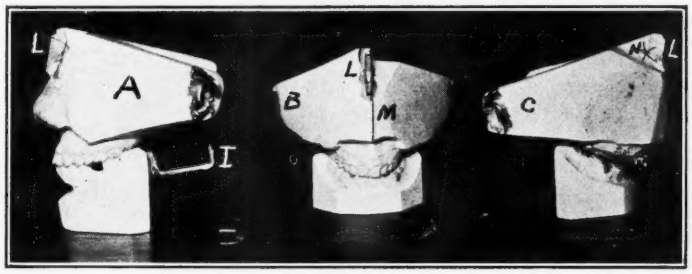


Fig. 4.—Typical facial dental casts. Base of mandibular cast parallel to horizontal plane. *A*, model of colored girl; *M*, line indicating median vertical plane on model *B*; *I*, machined brass insert; *L*, nasion locator, models A and B; *N*, nasion located on model C at the intersection of two arcs. Nasion and tragial areas poured in metal.

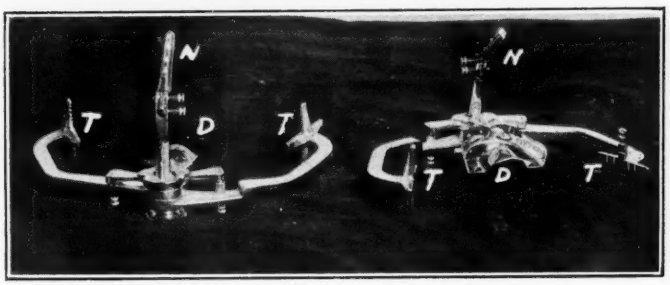


Fig. 5.—Dentofacial trays. D, dental cup; T, tragial appendages; N, nasion appendage.

the same mix, the nasion locator is completely covered. The thickness of this plaster should not exceed one-fourth inch. From a second mix of impression plaster, a sufficient quantity is placed in the dental cup of the dentofacial tray which has already been adjusted to conform to the patient, and is seated in position covering the maxillary arch. (Fig. 6.) A little plaster is then added connecting the three facial arms with the plaster previously placed on the face. In a very few minutes the impression is ready for removal. The facial arms are removed separately and then reassembled. An impression of the mandibular arch is taken in the usual manner with an ordinary mandibular tray and the child is dismissed. This completes the operative phase of the work.

The impression is now ready for pouring. The only different element about the construction of this model from any ordinary maxillary model is

the development of the three facial areas. We have always made it a rule to pour a low fusing metal in the impression of three facial areas, as you will see. The advantages of this metal are obvious, and using it takes but little more time. The separation of the model is a simple affair, inasmuch as the impression tray can be dismembered and the impression of the three facial areas can be easily pried off the model.

With a heavy rasp, the model can be smoothed off, care being taken not to disturb the anatomy of the facial parts and the teeth.

The next step is to locate on the model the three points previously mentioned. A line is drawn along the crest of the tragus up to the notch separating it from the helix; then another line is drawn along the groove above the tragus. The intersection of these two lines is our tragial point. On the relating table, the median plane of the model is established (Fig. 4*M*), and a line is drawn on the bridge of the nose indicating that plane. From the x-ray picture the nasion in its relation to the nasion locator is determined and

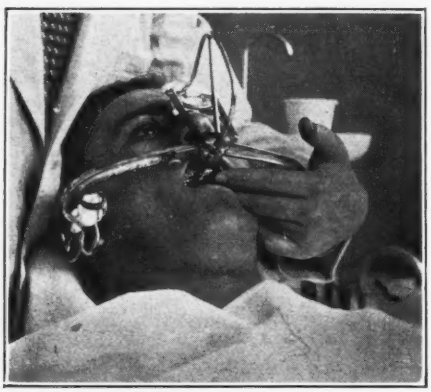


Fig. 6.—Facial dental tray in place.

transferred to the median plane of the model in the same relative position (Fig. 4*N*). The enlargements are readily corrected due to the standardization of the x-ray apparatus. After the three points are located, the model is set up with relation to the projecting instrument.

The relating table is a device which is in an unalterable position to the projecting table (Fig. 7). It is our desire to set the model on this table in a fixed and unchangeable position to the projecting instrument. To accomplish this, the model is placed in an adjustable holder which permits the orientation of the model to the relating table in the desired position (Fig. 8). At this stage, however, the model is neither fixed nor unalterable in its position. A piece of machined brass, resting in a slot for that purpose on the table, is affixed to the model by means of plaster. The clamp can be removed and the model is now in a fixed and unalterable relation to the projecting instrument and to the table (Fig. 9). It is important to note that should this relationship vary a fraction of a millimeter at any time, it is readily discernible. The mandibular model is set against the maxillary model in its correct dental relationship, held firmly, and a similar piece of machined brass

affixed to it in a like manner. The model is now ready for projections. The brass attachments permit the rotation in a vertical plane and enable us to make various projections (Fig. 9).

A typical map obtained from this technic is seen in Fig. 11. Note the craniocephalic triangle marked T.N.T. which is obtained from the three points

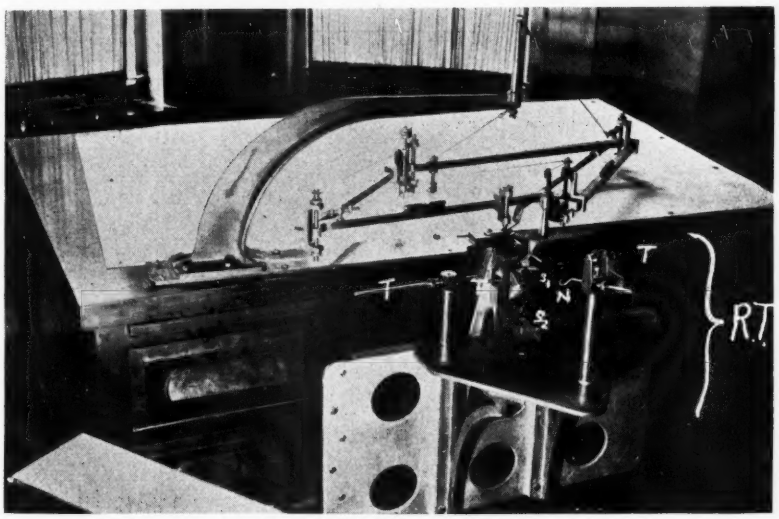


Fig. 7.—Relating table (R.T.) and projecting instrument. T. N. T. Tragion-nasion-tragion pointers set 15° above horizontal plane. S, Slots on a revolving disc mounted on a slide for the reception of the machined brass inserts. (S_1) Upper. (S_2) Lower.

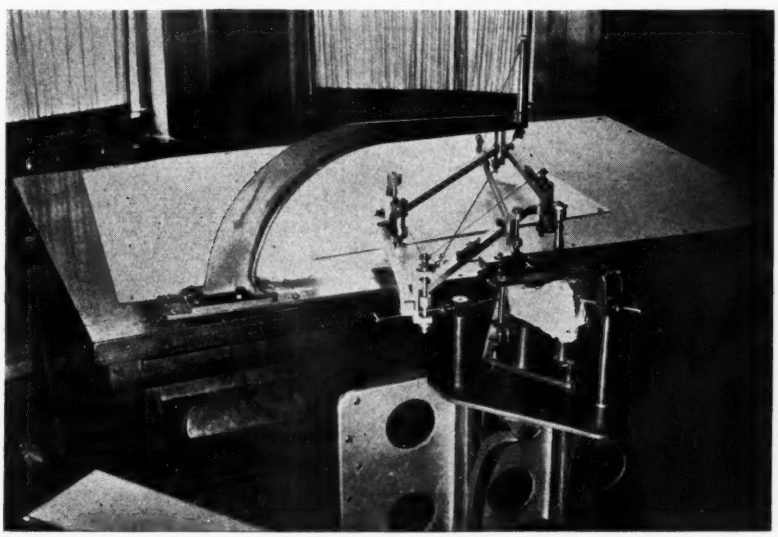


Fig. 8.—Model held in position by adjustable holder. T. N. T. points of model in relation with T. N. T. pointers of relating table.

projected on the horizontal plane. Fig. 11*A* shows occlusal view of both maxillary and mandibular teeth superimposed. Fig. 11*B* is a lateral projection on the vertical sagittal plane of the right teeth, and Fig. 11*C* is a similar view of the left teeth. Any point can be taken off the dentition on the map and located with reference to the three planes of the head.

If it is desired to measure instead of to project directly, the model can be oriented on the instrument shown in Fig. 12 by means of the same metal appendage. I have confined the use of this instrument to skulls, and therefore it is not necessary in this technic.

While it may appear that the technic is a difficult one, it is really simpler to execute than to describe. The present tendency in treatment is precision

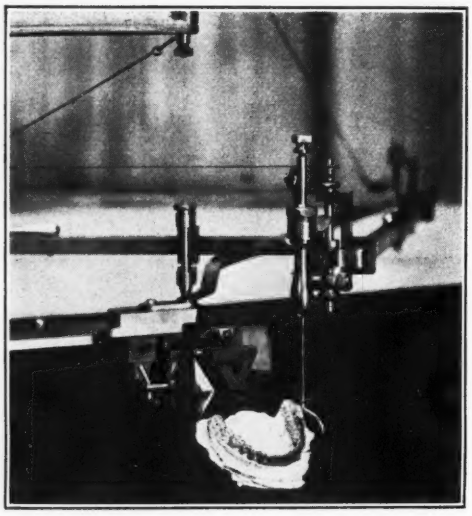


Fig. 9.—Clamp removed. Mandibular model held in position by its metal insert. Ready for its occlusal projection. Vertical or horizontal projections can be made of both maxillary and mandibular models together or individually.

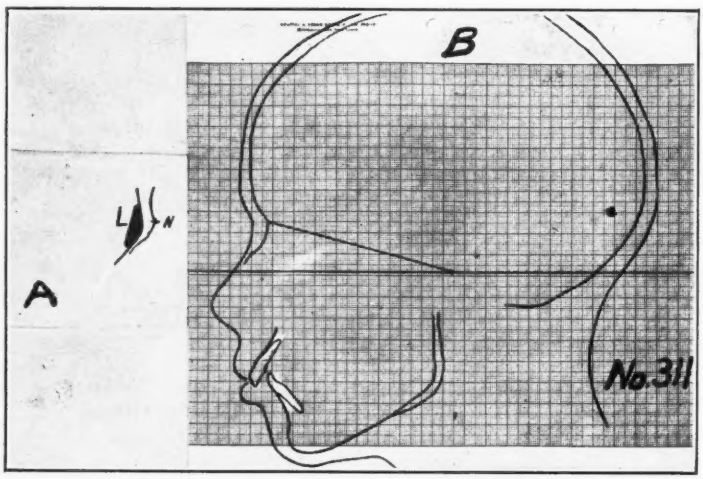


Fig. 10.—*A*, Outline of nasion area obtained from nasion area x-ray or profile x-ray picture. L, nasion locator; N, nasion of skull. *B*, Outline obtained from profile x-ray picture of Case 311 (see Fig. 11).

and rationalization of procedure. Certainly that should be associated with accurate records of conditions prior to and following treatment.

Very often in description, quite dissimilar morphologies are classified as similar types. Also in analysis of treatment from the usual models, it is fairly possible that what may have appeared to have changed would hardly coincide with the movements of the dentition that have actually taken place.

Whatever technic one employs, providing it does not permit of errors which would invalidate results, every practitioner can provide records of treatment of selected cases which in the aggregate would make a wonderful

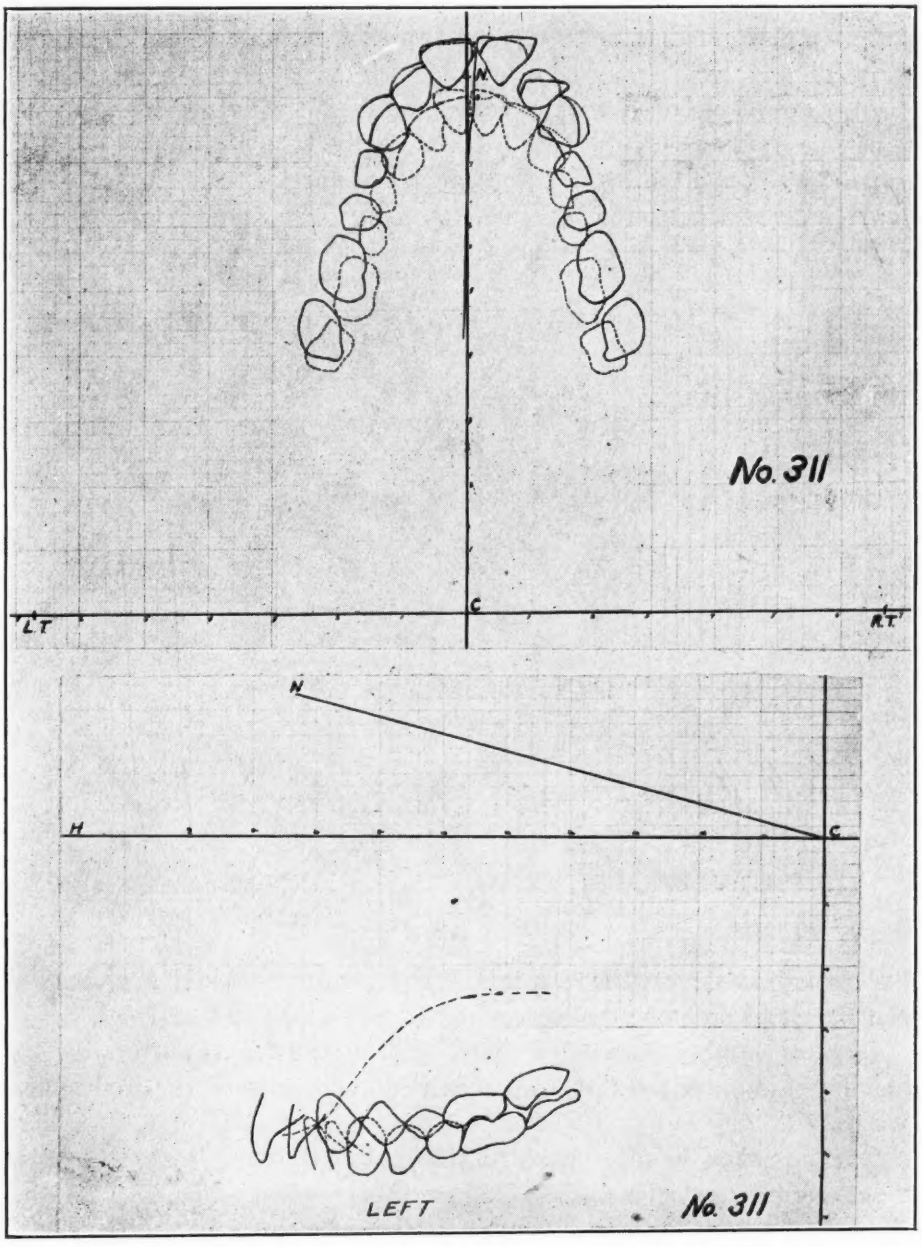


Fig. 11.—Maps and models of Case 311 on coordinate paper.

fund of data for research and standardization of our rationale, and tend to eliminate statements without scientific basis.

The purpose of this paper, as has been mentioned, is merely to outline the technic employed for obtaining facial-dental casts and records, and to describe the apparatus used. I am aware of the importance of accuracy and

the dependence of material obtained upon the exactness with which it had been obtained. Therefore, a close examination of that accuracy is very desirable.

It is not in the province of this treatise to draw conclusions, nor even to present material for any deduction. However, it might be of interest to mention the work that is being done to suggest the trend of thought that is evoked.

A group of children with excellent occlusion ranging in age from five to twenty-one years is being recorded and studied. The purpose is to observe normal development of which too much cannot be learned. Ranges of development are constructed for each tooth in three dimensions. These ranges are developed with two references: one with relation to the nasion, and the

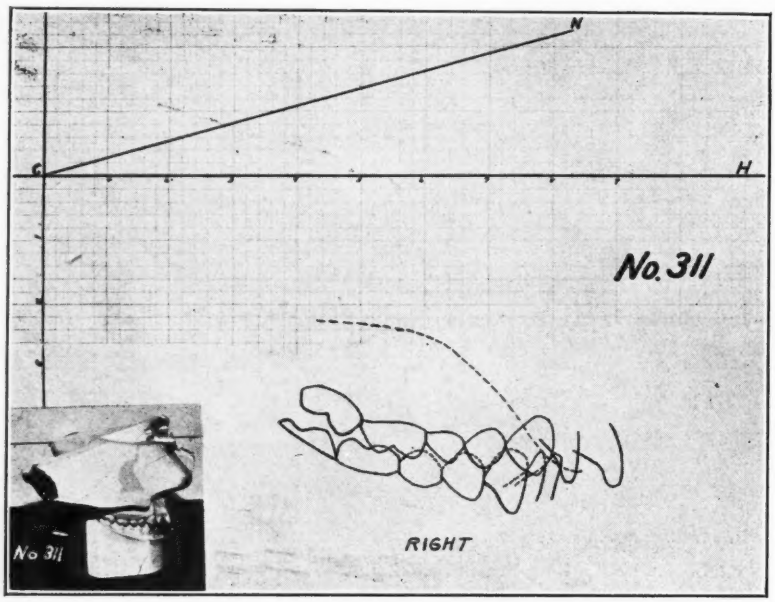


Fig. 11-*C*.

other with relation to the bitragia. The former would be with relation to the profile and the latter with regard to the depth of the head.

Rectangles are constructed which indicate as far as material permits the maximum-minimum position of a given tooth in any of the three dimensions desired.

There is then being developed the fact that there is an individual form for dentocranial relationship as Hellman observed existed in occlusion. There is, however, a limit or extent of variation of a tooth to the landmarks selected.

There has been a tendency to define as normal a relationship of a tooth to certain landmarks of the face by means of a point or line. The variation we find makes such a procedure questionable unless the limit of variation be stated, and allowance for the fact that anywhere within that limit may be correct for the individual.

In the study of abnormalities of the dentition it has been helpful to subject each tooth of the abnormality to its particular range in the various

dimensions and relations. This procedure throws considerably more light as to where the greatest and least variations may be found.

This fact was demonstrated more clearly at the Oklahoma meeting of the American Society of Orthodontists. Several cases of Class II, Division 1 were shown. In some, the maxillary incisors, canines and molars were well within their anterior and vertical range while the mandibular teeth were beyond their limits in varying degrees, sufficient to indicate that there existed a lack of development of those teeth. In other Class II, Division 1 cases, however, the mandibular arch was in a very satisfactory anteroposterior position with relation to their maxium-minimum variations. The maxillary denture, however, showed the greatest variation. The interesting phenomenon was the less relative displacement of the maxillary first molar or to be more exact, of the mesiolingual cusp of that tooth, as compared to every other tooth

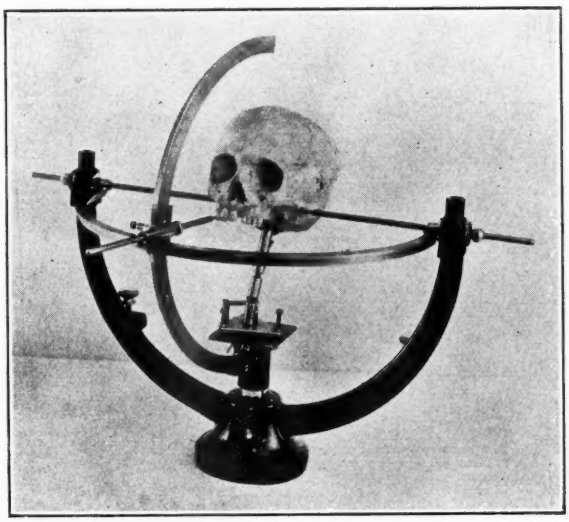


Fig. 12.—Spherical apparatus used for the measuring of skulls. Skull oriented on porion—porion nasion plane.

in the dentition. Despite the fact that there was a displacement of other teeth as judged by any means of diagnosis, the maxillary molars showed the least disturbance. In dentitions in which there is no mutilation by premature extraction, the observation of the displacement of a canine or incisor is not sufficient to so determine the entire arch. It appears from our study that the molars as all other teeth have to be subjected as well to their respective range, and with equal detail. The wisdom of Dr. Angle has been forcibly impressed on me, and I hope to present in the future some evidence that attests to his uncanny observations.

Likewise, Class I and Class III cases were exhibited demonstrating the necessity for subjecting the entire denture to examination for a clear concept of existing conditions.

Dr. Strang has emphasized quite forcibly in his excellent textbook the necessity for a detailed knowledge of the inclination of all teeth. That

these facts should be arrived at with precision is undebatable. Such information relative to inclinations of teeth is obtained from these records as demonstrated at the meeting.

A phase of our study which seems interesting is that of recording various racial types. When sufficient of these records are made, they will be presented.

No defense or too urgent plea seems necessary for the development of accurate records from which to base further study. The only problem for an orthodontist is to select that technic which to him appears to best suit his requirements.

I am deeply grateful to all those who have assisted me: Professor Earnest A. Hooton of Harvard; Mr. Parmakian, my associate; Dr. Fish, Director of Massachusetts State Hospital School; and Mr. Cyrus Kirshen, an engineer.

Finally, I want to assure any reader that duplication of any of the apparatus described is entirely permissible. My own purpose will be served if I can by this work make some contribution to our profession.

THE USE OF MAXWELL'S LAW IN COMBINATION WITH A NEW INSTRUMENT IN THE DESIGN OF ORTHODONTIC SPRINGS*

GEORGE R. MOORE, D.D.S., M.S., ANN ARBOR, MICH.

REPORTS of flexibility studies on orthodontic wires began to appear in the literature in 1927 when Irish first described the instrument since referred to as the Irishometer. In 1933 Peyton collaborated with me in adapting the cathetometer to flexibility studies. Both the Irishometer and the cathetometer lend themselves well to laboratory work but cannot be adapted to practical office needs.

Dr. Joseph E. Johnson removed the pan from an ordinary postal scale and adapted it to practical use on appliances with some success. It did serve the purpose to demonstrate the flexibility of the Johnson twin wire, but it was not adequate or flexible in its application to orthodontic needs.

Dr. J. E. Richmond devised in 1933 a spring balance in pencil form to measure pressure of orthodontic springs and tension of ligatures. Although highly practical in design and certainly up to that time the most adaptable of all appliances to office needs, this instrument was unsuited to intraoral requirements.

With the above limitations in mind I have been engaged for the past few months in the design of an instrument better adapted to intraoral as well as extraoral needs. The resulting instrument, shown in Fig. 1, is equipped with a right and left hook at the free end to permit the operator to engage a spring any place in the mouth and to displace it an infinitesimal amount wherever it may be located. As will be shown below, a correct intraoral reading of spring force acting on one tooth where one or more other teeth receive pressure from the same spring, can only be obtained by taking the instrument reading while displacing that point an infinitesimal amount. The instrument shown in Fig. 1 is an uncalibrated working model. Standard calibrations will be made from zero to 50 grams unless otherwise required by the purchaser. Many appliances in use today are known to deliver 400 grams and over. This instrument can be calibrated to meet those requirements if desired. A lock (L) makes it possible to remove the instrument from the mouth before taking the reading which, in turn, is facilitated by the arrow (A).

Not only are we indebted to the engineering profession for many of the mechanical details of this instrument, but we are also indebted to it for suggesting an aid which has proved very valuable and useful. I refer to the simple principle of mechanics known as Maxwell's law, which is directly applicable to spring design. By applying this rule it becomes a problem in simple arith-

*Clinic presented at the Thirty-Second Annual Meeting of the American Society of Orthodontists, Oklahoma City, November, 1933.

metic to design a reflex or any other variety of orthodontic spring so that it will deliver predetermined pressures on each of several teeth with which it comes in contact at the time it is inserted. Do not misunderstand: this does not mean any time after insertion, for forces applied by a spring wire are soon upset because some teeth will move more rapidly than others. It does mean, however, that we have at least the means to determine the pressures acting at the moment the springs are inserted. This is, in my opinion, a distinct advantage and is better than not having any calibration of the forces applied by the spring at any time.

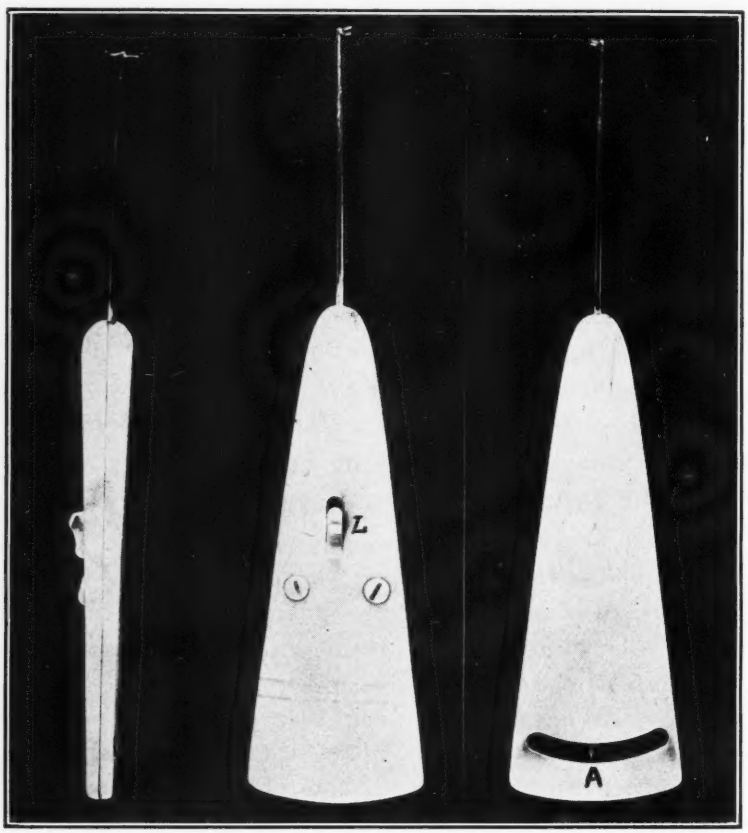


Fig. 1.

Maxwell's law may be stated as follows (See Figs. 2 and 2a): If a load Q be placed at a point B and cause at a point C a deflection equal to d, then the load Q placed at point C will cause at the point B a deflection equal to d. This law permits the transposition or interchange of loads and deflections. Thus, a load of Q at each of the points B and C will give at B a deflection of $D + d$ (Fig. 3). Loads of Q at B and $\frac{1}{2}$ Q at C would give a deflection at B equal to $D + \frac{1}{2}$ d.

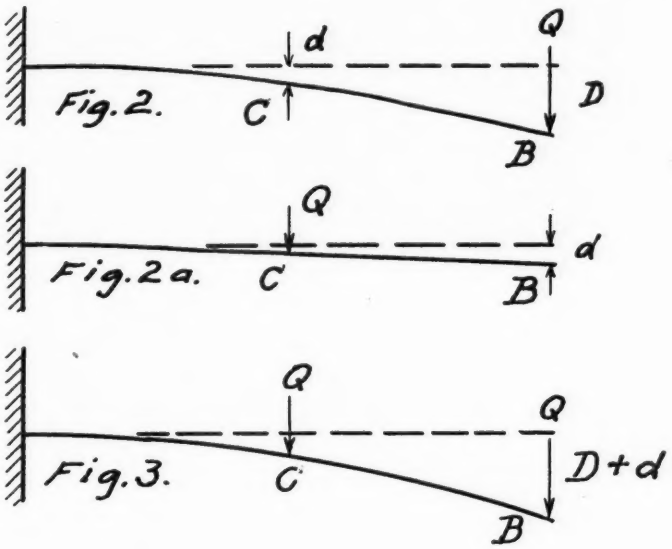
By applying the above principle, orthodontic springs of all types may be designed to deliver just the forces desired at any or all of the known points of contact with teeth. After one has decided on the type of spring (simple, reflex, compound, coil, etc.) and soldered it to the body wire, the procedure is as follows:

(1) With the above described force gauge or dynamometer, take extra-oral readings at each of the points on the spring which are intended to be in contact with teeth, displacing the spring until the instrument indicates the number of grams force desired at that point.

(2) By laying the wire on cross-section paper (Fig. 4) note displacements on the spring at the point of load application (*D*) and, with load still applied, at all other points (as *B* and *C*) intended to contact teeth.

(3) Repeat procedure described in paragraph (1), applying the desired force at each point, noting and recording displacements at the point of loading and at each of the other contact points (see Figs. 5 and 6).

(4) Add the displacements at each contact point caused by direct and remote loads. The total gives the amount of displacements required in the

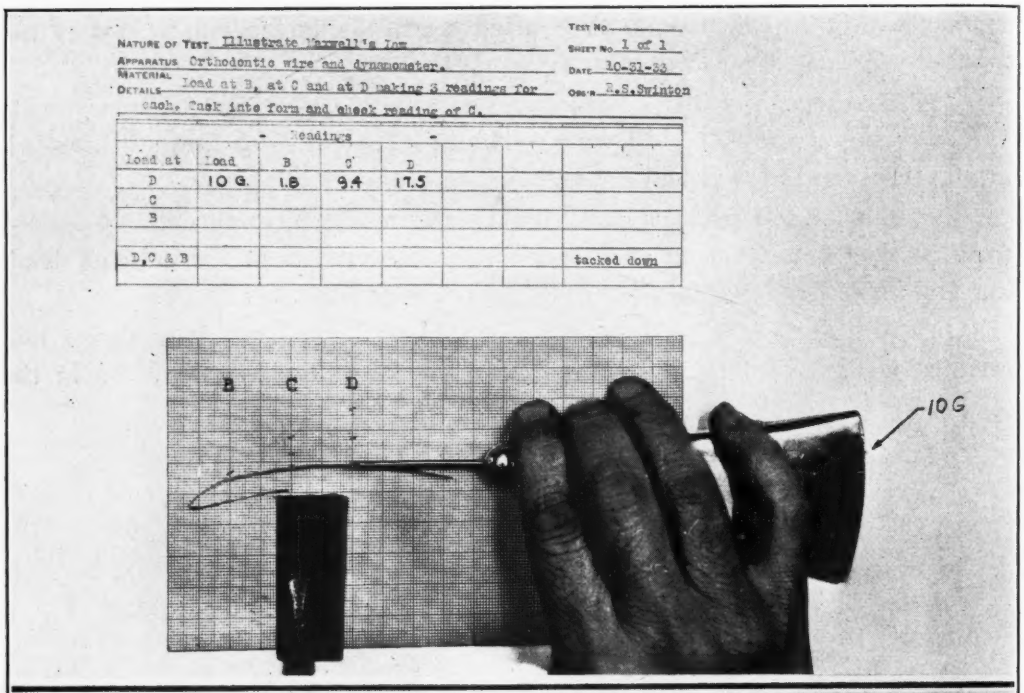


finished spring wire when inserted. The steps of this procedure are clearly demonstrated in Figs. 4 to 6.

Readings have been noted, recorded, and photographed as the observations were made. Tabulations representing equal deflections according to Maxwell's rule have been joined with arrows in Figs. 5, 6, and 7. In Fig. 7 points *B*, *C*, and *D* of the spring illustrated in Figs. 4, 5, and 6 have been tacked down. Under these conditions an infinitesimal deflection at *C* gives a dynamometer reading of 10 grams, which force the spring was designed to deliver. This illustrates what can be done in the mouth to obtain fairly accurate, direct, intraoral readings, using the gauge to displace the point in question an infinitesimal amount.

Application of Maxwell's law permitting the transposition of loads and deflections would, however, simplify the design of such springs. In Fig. 8 appears a practical illustration of spring design to meet predetermined specifications. Instead of taking nine readings as shown in Figs. 4 to 7, it should be clear from a study of Examples 1 and 2 that six readings are sufficient

Fig. 4.



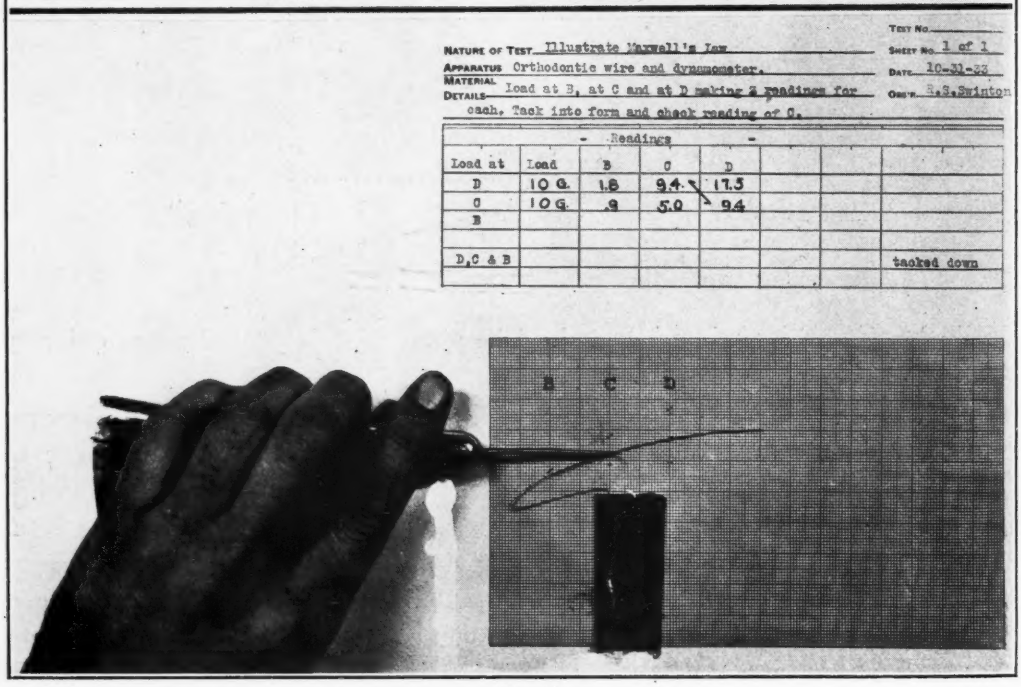
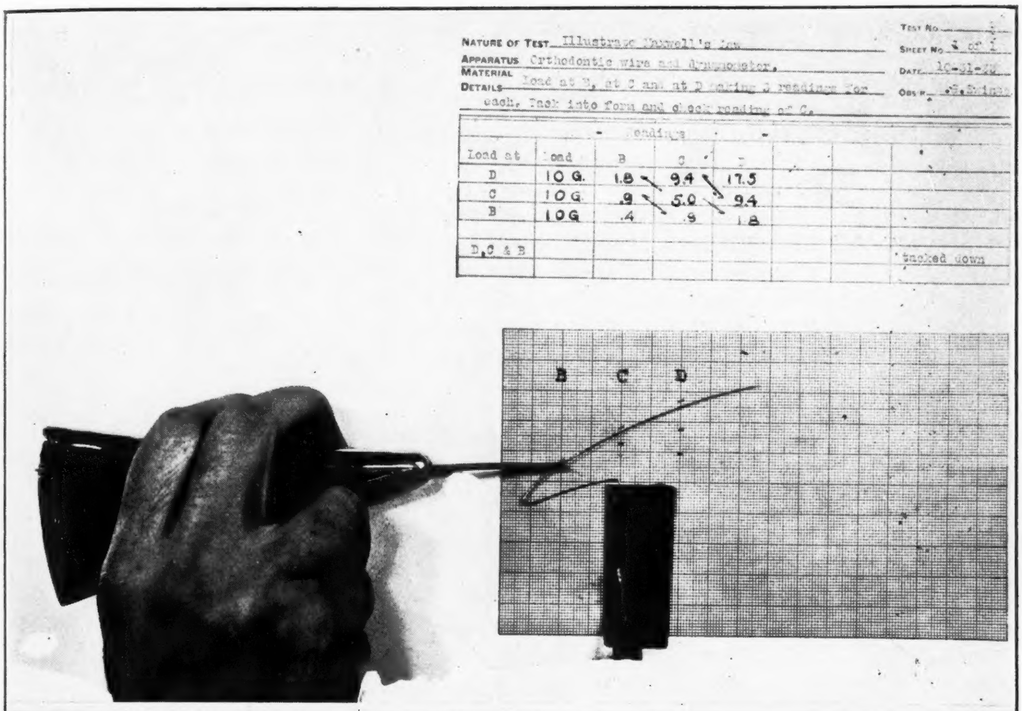


Fig. 5.

if Maxwell's law is utilized in the design of any three-point spring. In Fig. 8 (Example 1) deflections are determined which will deliver equal loads at points *B, C,* and *D,* and are illustrated in the drawing on the right, while

Fig. 6.


Test No
Nature of Test
Sheet No
Apparatus
Material
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Load at
D
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10 G.
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D, C & B
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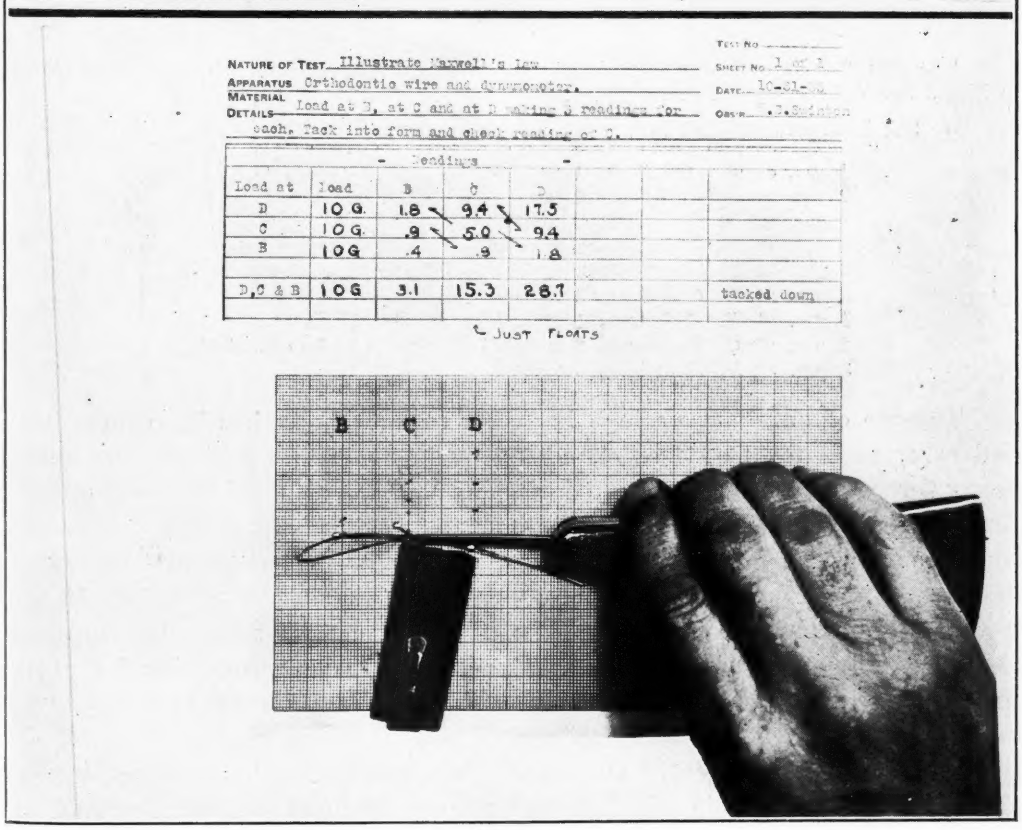
B C D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10 G
.4
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1.8
D, C & B
10 G
3.1
15.3
28.7
tacked down
JUST FLOATS
B C D

Fig. 7.

in Example 2 the spring is designed to deliver unequal loads at points *B*, *C*, and *D*, on the basis of the same six original readings used in Fig. 8 and Example 1.

EXAMPLE 1.—An orthodontic spring is to be designed to conform with the shape shown and deliver 1 gm. loads at *B*, *C*, and *D*.

By test it was found that:

1 gm. at *D* deflected *D* 0.27 cm., *C* 0.14, and *B* 0.04
1 gm. at *C* deflected *C* 0.08 cm., and *B* 0.025 cm.
1 gm. at *B* deflected *B* 0.01 cm.

By Maxwell's law the load (1 gm.) moved from

D to *C* will cause *D* to deflect as *C* did before, or 0.14 cm. at *D*.
D to *B* will cause *D* to deflect as *B* did before, or 0.04 cm. at *D*.
C to *B* will cause *C* to deflect as *B* did before, or 0.025 cm. at *C*.

Total deflections at *B*, *C*, and *D* delivering 1 gm. load will be

at *B*, 0.04 cm. + 0.025 cm. + 0.01 cm. = 0.075 cm.
at *C*, 0.14 cm. + 0.08 cm. + 0.025 cm. = 0.245 cm.
at *D*, 0.27 cm. + 0.14 cm. + 0.04 cm. = 0.45 cm.

Hence the design shown in Fig. 8.

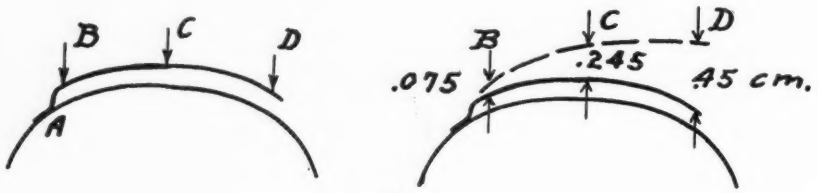

Fig. 8.

EXAMPLE 2.—An orthodontic spring is to be designed to conform with the shape shown in Fig. 8 and deliver 1 gm. at *B*, 2 gm. at *C*, and 3 gm. at *D*.

By test it was found that for:

1 gm. at *B*, *D* deflects 1 × 0.04 = 0.04		
2 gm. at *C*, *D* deflects 2 × 0.14 = 0.28	}	1.13 cm. at *D*
3 gm. at *D*, *D* deflects 3 × 0.27 = 0.81		
1 gm. at *B*, *C* deflects 1 × 0.025 = 0.025		
2 gm. at *C*, *C* deflects 2 × 0.08 = 0.16	}	0.605 cm. at *C*
3 gm. at *D*, *C* deflects 3 × 0.14 = 0.42		
1 gm. at *B*, *B* deflects 1 × 0.01 = 0.01		
2 gm. at *C*, *B* deflects 2 × 0.025 = 0.05	}	0.18 cm. at *B*
3 gm. at *D*, *B* deflects 3 × 0.04 = 0.12		

The use of auxiliary springs in orthodontic practice has been on a trial and error basis for many years. Some men have thought they were using heavy forces; more of them boasted of using light or so-called "physiological" forces. None of them has known how much pressure was actually delivered by his springs. The "heavy" spring of one man is the "light" spring of another. Formerly valuable knowledge concerning success or failure in the use of various amounts of force produced by a spring has been lost to practical use. Oppenheim's recent contributions warrant recognition by every practitioner of orthodontia. If forces used in practice are put on a measured and recorded rather than on an estimated basis, our knowledge of the effects of pressures will be greatly enhanced. We shall soon learn something of the optimal range within which forces applied to bone are least harmful to it. The use of Maxwell's law in combination with the instrument described offers the following advantages:

1. The possibility of obtaining definite knowledge pertaining to the application of force and of disseminating it to the profession. Heretofore this knowledge could only be obtained through long experience with "hit or miss" methods.

2. The possibility of comparing the effects of varying forces applied on similar or dissimilar cases in one's own practice.

3. The elimination of guesswork in spring design.

The author wishes to express his thanks and appreciation to Roy S. Swinton, Associate Professor of Engineering Mechanics at the University of Michigan, for his interest, particularly for his valuable assistance in instrument design and for his suggestions on the application of Maxwell's law.

A PRACTICAL SUGGESTION

ALBIN OPPENHEIM, VIENNA, AUSTRIA

FOR the treatment of impacted teeth the use of a pin with several hooks soldered at different levels (Fig. 1) has many advantages. These hooks should be soldered not only along one side but also at different points over the entire periphery of the pin, as shown in Fig. 2 (the transverse section of Fig. 1). The hooks 1 to 4 in Fig. 1 correspond to 1 to 4 in Fig. 2. Because of this soldering at different points of the circumference, several hooks appear quite shortened in the x-ray picture (Fig. 4), and some are entirely hidden by the pin. For the purpose of cementing the pin to the tooth, the pin is lengthened temporarily by some kind of wire (Fig. 3 *b*), fastened to it by means of sticky

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

wax (Fig. 3 *a*), thus forming a practical handle. After the cement has become hard, the wax is removed by heating. At the end of the pin which is cemented into the tooth a thread has been cut for better retention (Fig. 1 *a*).

If one uses a pin with only one hook at the free end, as is usually done, one is often inconvenienced by the fact that the pin must be shortened because it interferes with the occlusion as the tooth comes down. Because of this shortening the hook is lost, and with it the means of applying further force to the tooth; it then becomes necessary to remove the pin and to replace it by a new pin with a hook. In extreme cases this can occur a second time.

These inconveniences cannot occur when using a pin in the shape of a ladder. As the tooth erupts and the lowest hook (No. 1 in Fig. 1), which was first used for the attachment of rubber bands, approaches the opposite teeth, this

hook, No. 1, is cut off with a fine fissure bur and the next higher hook, No. 2 (Fig. 1), is used for the attachment of the rubber bands.

In addition to these technical remarks, I should like to give my general experiences in the use of elastic bands in the treatment of impacted teeth. In many impacted and "freed" canines, whose eruption was forced artificially, death of the pulp could be diagnosed years later, indicating that the "eruption" had taken place too fast. The procedure as practiced now is such that only the weakest rubber bands, punched out of rubberdam, are worn *only three times a week* and *only during the night*. Thus the "delivery" of the tooth takes much more time, but the danger of the pulp's dying in the future is eliminated. My experience with this kind of restricted active treatment does not cover more than eight years (six cases); this is too short and too limited a time to be able to predict with certainty the elimination of pulp death by this procedure, for when continuous active force was applied even with the most delicate rubber bands, as was done until eight years ago, the death of the pulp, viz., the granuloma, was in several cases not diagnosed until ten and thirteen years later. I know of one case in which root amputation was twice performed on such a canine, and finally the tooth had to be extracted.

THE CAST GOLD RESTORATION AND RETAINING APPLIANCE*

HARRY H. SORRELS, D.D.S., OKLAHOMA CITY, OKLA.

THE cast gold restoration and retaining appliance is offered as a restorative and retention solution for those adult cases that show a diversified collapse from the loss of several teeth.

Beautiful orthodontic work can be done in those cases providing of course that they are favorable for treatment by having normal supporting structure and sufficient other favorable conditions; however, the question of retention then is always an acute one.

This clinic is therefore offered as an answer. The technic involved in the construction is the same as in all cast removable appliances.

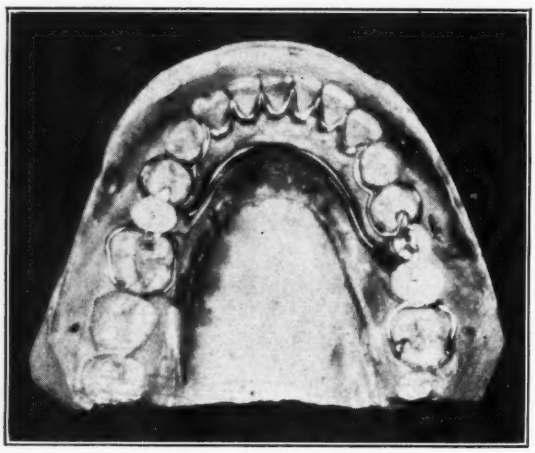

Fig. 1.

The only part the orthodontist plays in the picture is in helping design the retentive qualities to meet the orthodontic requirements of the case; the patient's dentist should be the responsible party and charge the fee, the orthodontist only cooperating.

Fig. 1 illustrates a case where a general collapse of the mandibular arch had taken place; the anterior teeth collapsing lingually and the molars drifting mesially, the teeth are all moved into their relative positions and then the restorative and retention work can be instituted immediately and the case dismissed.

This work has many virtues, namely: (1) wider range on adult cases by reason of easy retention; (2) work can be completed and case dismissed early; (3) little or no danger of collapse.

*Clinic presented at the Thirty-Second Annual Meeting of the American Society of Orthodontists, Oklahoma City, Okla., November 8-10, 1933.

DEPARTMENT OF
DENTISTRY FOR CHILDREN

EMERGENCY DENTAL RELIEF: NEW JERSEY PLAN

SURVEY—DENTAL SERVICE—EDUCATION—RELIEF

J. M. WISAN, D.D.S., ELIZABETH, N. J.
Chairman, Council on Mouth Hygiene, New Jersey State Dental Society

IN *The Journal of the American Dental Association,* issue of June, 1933, the New Jersey State Plan of dental health education and dental service promotion was described—a plan which proposed dental health education for all and community dental service programs for indigents.

It has been recognized by health authorities that the improvement of community health involves:

1. Disseminating scientific health information to prevent disease.
2. Developing health habits.

Without a doubt, it is easier to present information than it is to actuate the layman to adopt health practices. This is particularly true in dealing with the dental problem. It is recognized, for instance, that dental care during the preschool and school ages is the sine qua non of the dental health program; yet all reports indicate that approximately 20 per cent of our school children obtain routine dental treatment. The Council on Mouth Hygiene of the New Jersey State Dental Society in its efforts to improve the dental health of New Jersey school children has been energetically using every possible means of broadcasting dental health information. The Council has been able to evolve a program which has received much praise from educational authorities; but its efforts to obtain dental service for indigent children met with little success until December 24, 1933. On this date, the Council was notified that the Emergency Relief Administration had accepted its plan of promulgating a state-wide dental project with the following objectives and aims:

1. To make a survey of dental conditions among children in conjunction with the United States Public Health Bureau.
2. To promulgate an educational program so that the children of New Jersey could be taught how to prevent dental disease.
3. To provide dental treatment for indigent school children.
4. To rehabilitate dentists in financial difficulties.

The project (Civil Works Service Children's Dentistry Project #6247) started January 2, 1934, and continued until April 26, 1934. However, 104 of

the dentists and an equal number of dental assistants employed on this project rendered treatment without compensation during the week of April 27 to May 3. Therefore, it can be said that the project functioned for a period of seventeen weeks, during which time 315,000 children were inspected and 32,447 children were given dental treatment.

1. *Dental Survey.*—The primary purpose of the survey was to obtain a cross-section study of dental conditions among New Jersey school children. This was accomplished in the cities by examining children in different sections, being sure to include children of all economic levels. Also, communities were selected with the idea of including industrial, suburban, urban, and rural school districts. The examinations were conducted in the public and the parochial schools. Dentists used mouth mirrors and explorers in accordance with Walker Type #2 method.

More than 315,000 children have been inspected and their charts sent to Washington where the final statistical compilation will be made. The Bureau proposes to make the New Jersey statistics available to us after September 1, 1934.

When the statistics of the survey are completed, it is the intention of the Council on Mouth Hygiene of the New Jersey State Dental Society, through the State Department of Public Instruction, to publish the New Jersey statistics in convenient form and present a copy to the school administrators and health officials of the participating communities.

As the complete statistics of the survey will be published by the United States Public Health Bureau, it will suffice at this time to state that 90 per cent of the pupils examined throughout the state required dental treatment and that statistics compiled to date reveal that 54 per cent of the children had never received any form of dental treatment; only 20 per cent of the pupils had had the benefit of fillings. A subsequent survey was made to compare the first permanent molars of pupils who had the benefit of fillings, with the first permanent molars of children who had not had these teeth filled. This study included 2,500 children. It was found that the children who had had the benefit of fillings in their first permanent molars, had lost 1 per cent of their first permanent molars, while those who had not had the benefit of fillings in these teeth had lost 30 per cent of their first permanent molars.

2. *Promulgation of Educational Program.*—The newspapers of the state made frequent mention of the possibilities and advantages of the project by news items and editorial comment.

Teachers took advantage of the survey to have pupils write essays on the interrelation of dental health and systemic health, and developed other class studies using the dental survey as a background. An unprecedented interest in dental health was shown by many boards of education in the state as a result of the project.

The fact that the Emergency Relief Administration deemed it appropriate to give a considerable amount of money to provide dental treatment for indigent children, is a factor of great importance in conveying the knowledge throughout the state, that dental health plays a significant rôle in child welfare.

With the cooperation of the Council on Mouth Hygiene of the New Jersey State Dental Society, it was possible to distribute more than 300,000 educational leaflets. Every child undergoing inspection was given one of these leaflets which had been suggested to the Council by its consultant, Sally Lucas Jean.

Prior to Child Health Day, and during the closing days of the project, 50,000 posters, entitled "A Message for Child Health Day," were distributed throughout the state.

Already the project has had its effect in arousing interest in dental conditions among school children. To cite an example, a group of educators and health administrators of Essex County, called the Essex County Mouth Health Committee, has begun the formulation of a health education program, informing school-teachers how to present dental health information to pupils.

When the data showing dental conditions in Essex County were announced, the above mentioned Committee organized a discussion meeting, inviting authorities on the various phases of child health to participate and give their views on the subject, "How Can We Improve the Dental Health of Our School Children?"

The meeting was held Monday evening, April 30, 1934, in the auditorium of the New Jersey State Normal School in Newark. School administrators, teachers, parents, nurses, physicians, and dentists from Essex, Hudson, and Union Counties (the three most populous counties in the state) were invited. Approximately two hundred and fifty responded.

Not satisfied with mere discussion, the Committee urged M. E. Townsend, Ph.D., president of New Jersey Teachers' College, to include a course in Principles of Dental Health Education among the extension courses for teachers and school nurses. The request has been granted; such a course will be offered at the State Normal School next fall.

An additional educational benefit may be considered as the result of this project, namely, the opportunity afforded the New Jersey State Dental Society to study various methods of rendering dental treatment to indigent children.

The project served as a demonstration of the efficacy of combining the dental service program with the health education program.

3. *Treatment for Indigent School Children.*—The plan of organizing statewide dental service by means of state and county professional supervision made possible by organized dentistry, proved exceedingly practical in obtaining prompt and felicitous action.

The principles of providing treatment were outlined by the State Emergency Dental Relief Advisory Committee of the New Jersey State Dental Society and set forth in instructions given to every dentist operating for the project.

It may be said that the plan of providing dental treatment under this project was arranged with two objectives:

(1) To render dental service to indigent school children,

(2) To study the various methods of rendering dental treatment to indigent school children.

1. *Treatment.*—The following tabulation gives the number of the various operations performed:

Total number hours dentists operated	16,284
Total number pupils treated	32,447
Total number permanent teeth extracted	8,827
Total number deciduous teeth extracted	16,358
Total number silver amalgam fillings	20,874
Total number copper amalgam fillings	756
Total number cavity linings	3,672
Total number synthetic fillings	2,300
Total number cement fillings	750
Total number prophylaxis (cleanings)	7,029
Total number operations	60,566

2. *Studying Methods of Rendering Treatment.*—Comparing the efficacy of the school dental clinic, the hospital clinic, the private dental office, and the portable and mobile outfits, the following observations were made:

The school dental clinic is undoubtedly the most advantageous method in the larger industrial cities having a large percentage of indigent school children.

The hospital clinic is particularly suitable for surgical operations and extractions where general anesthesia is indicated.

The private dental office is without doubt the most economical in the greatest proportion of school districts.

Perhaps at this point it would be well to present the advantages of the private dental office.

1. Small communities find it inadvisable to expend sufficient money to purchase modern and complete equipment; for example, the purchase of an x-ray machine involves an expenditure of from five hundred dollars to one thousand dollars. On the other hand, the private dental office in the majority of instances has adequate equipment. Better equipment means more complete and more scientific dental treatment.

2. Visiting the dental office is an educational factor of great significance, teaching, as it does, the child to assume responsibility for his health. This point is considered an exceedingly important one to dentists interested in maintaining the present economic status of the dental profession.

It may be said in this connection, however, that in order to make the private dental office a part of a public health program, it is necessary to have the operations performed under careful professional supervision. Communities expending funds for dental service should be assured of a high standard of performance by providing competent dental supervision.

In rural sections that do not have a dentist practicing within their borders, the portable mobile equipment is the only available method of providing dental treatment. In this project, through the kindness of the State Board of Registration in Dentistry, it was possible to borrow twelve portable outfits by

means of which the dentists were able to provide dental services in outlying districts. While it must be admitted that this type of equipment did not enable the dentist to render complete service, nevertheless, it did afford the dentist the means of doing the most necessary operations.

Where dentists operated:

95 dentists operated in private offices
27 dentists operated in school clinics
1 dentist operated in hospital clinic
12 dentists operated with portable outfits

4. *Relief Afforded to Personnel.*—To illustrate how individuals were benefited, two cases which are illustrative of many others may be cited:

(1) Dr. ——— had been markedly successful, had been president of a bank, president of the Rotary Club, and had retired from private dental practice. Due to depletion of income and to unproductive investments, he found himself in dire straits. When appointed as a member of the staff on this project, he used half of his salary for his needs, saving the other half so that after ten weeks of employment he found it possible to make the first payment on an equipment for a dental office.

(2) A dental assistant when first appointed on this project, was in exceedingly difficult circumstances. Her husband had been unemployed for a period of two years. They had been borrowing from relatives and friends to buy food and shelter. It would be impossible to express the gratitude of this woman for the opportunity of earning fifteen dollars a week.

When discussing the relief aspects of this project, mention should be made that providing dental services to indigent children is an indispensable phase of relief work. All social studies indicate that the need of dental service is the most urgent remedial treatment required by children of the unemployed.

COST ANALYSIS

The total cost of the project was approximately $97,000; $132,936 had been allotted to the project.

The estimated cost of examining 315,000 school children was $40,437.

The cost of rendering treatment may be estimated as $56,498.98.

The following table illustrates how the funds were expended:

55%	of	total	expended	was	for	salaries of dentists
27%	"	"	"	"	"	salaries of clinic assistants
9%	"	"	"	"	"	salaries of supervisors
2%	"	"	"	"	"	salaries of secretaries
3%	"	"	"	"	"	supplies
3%	"	"	"	"	"	traveling expenses
1%	"	"	"	"	"	miscellaneous expenses—telephone, postage, stationery, etc.

In estimating the cost of treatment it was interesting to observe the relative cost of treatment before March 1 and after March 1, because of the change of the salary rate of the dentists. Thirty dollars for thirty hours' work was paid before March 1, but after March 1 the pay was thirty dollars for eight hours' work. (Note: This increased rate per hour was obtained at the request of the

State Emergency Dental Relief Advisory Committee of the New Jersey State Dental Society.)

Before March 1, the dentist was compensated for traveling expenses and given supplies and material needed to carry on his work. After March 1, he defrayed all his expenses and supplied his own materials.

The salaries of country supervisors were increased after March 1 from thirty-six dollars a week, plus allowance for travel and telephone, to forty-five dollars a week without allowances for travel or telephone.

The following table illustrates that the schedule of salary rates set up after March 1 was actually more economical. While the cost of treatment per hour increased because of the increased rate per hour given the dentists, the cost per operation decreased. Undoubtedly this was due to the fact that the increased rate was given with the stipulation that the dentist was paid for actual operating hours and was expected to perform four complete operations per hour. By complete operations, the following are referred to:

(1) Extractions
(2) Silver amalgam fillings
(3) Copper amalgam fillings
(4) Synthetic fillings
(5) Cavity linings
(6) X-ray pictures
(7) Trench mouth treatment (Vincent's infection)
(8) Prophylactic treatments (cleanings)

Cost of Treatment to March 1

Supplies	$ 3,312.00	
Traveling expenses, etc.	473.12	
Salaries	12,598.93	
Total		$16,384.05
Number of hours	8,740	
Number of completed operations	15,386	

Cost of Treatment after March 1

Salaries	$39,814.93	
Miscellaneous expenses	300.00	
Total		$40,114.95
Number of hours	6,977	
Number of completed operations	41,825	

The cost of dental treatment on this project designed solely as a relief project is not comparable with the usual cost of dental treatment in private offices inasmuch as no provision was made for office overhead.

ORGANIZATION

Chart 1 describes the organization of the project. The funds were provided by the New Jersey Emergency Relief Administration who supervised all expenditures. The professional policies were formulated by the Emergency Den-

tal Relief Advisory Committee of the New Jersey State Dental Society. The administrative policies were set up by the New Jersey State Department of Public Instruction through A. G. Ireland, M.D., Director of Physical and Health

CHILDREN'S DENTISTRY PROJECT

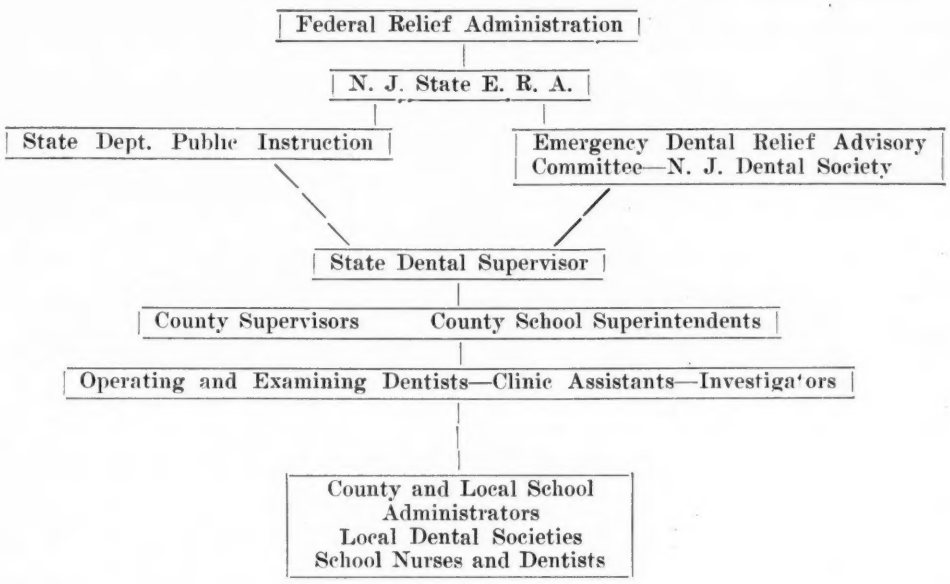

Chart 1.

Education. The chairman of the Council on Mouth Hygiene was designated as State Dental Supervisor, and the following dentists were appointed county supervisors to carry on the project within their respective counties:

County	*Name*	*Remarks*
Atlantic	S. F. Reese, D.D.S.	Voluntary
Bergen	Milton Kirshbaum, D.D.S.	Paid
Burlington	P. Conner Hulse, D.D.S.	Paid
Camden	G. R. Atkinson, D.D.S.	Paid
Cape May	M. A. Walker, D.D.S.	Paid
Cumberland	Frank M. Shapiro, D.D.S.	Paid
Essex	A. J. Shapiro, D.D.S.	Paid
Gloucester	E. M. Hitchner, D.D.S.	Paid
Hudson	A. C. Champaign, D.D.S.	Paid
Mercer	T. W. Thatcher, D.D.S.	Paid
Middlesex	P. R. Schwartz, D.D.S.	Resigned Feb. 15
	W. Z. Barrett, D.D.S.	Appointed Feb. 16
Monmouth	E. J. Thompson, D.D.S.	Paid
Ocean	G. T. Crook, D.D.S.	Until Mar. 1, when Monmouth and Ocean Counties were under one supervisor—(E. J. Thompson, D.D.S.)
Passaic	E. H. Cort, D.D.S.	Paid
Union	Mallory Hinman, D.D.S.	Paid

The personnel included one state supervisor, salary forty-five dollars per week with all transportation and expenses paid; thirteen county supervisors, salary forty-five dollars per week with no allowance for traveling or other

expenses; one hundred and thirty-five dentists, thirty dollars per week for eight hours' work, supplying their own materials and supplies; one hundred and thirty-three clinic assistants, fifteen dollars per week for thirty hours; seven secretaries, eighteen dollars per week for thirty hours.

It may be seen from the above that in spite of the handicaps due to the hasty organization of the Civil Works Administration, our project functioned with success.

First of all, the charts for conducting the survey of children's teeth were provided by the United States Public Health Service. This enabled us to begin work promptly on January 2, 1934.

Second, the supervision provided by the State Dental Society by means

WEEKLY OR DAILY CLINIC RECORD C. D. 6-25000

DENTIST
PLACE
DATE
NURSE
SCHOOL(S)

NAME OF PATIENT	GRADE		EXAMIN.	EMERG.	EXTRACTION		PERM. FILLING					TEMP. FILLING					PROPHYLAXIS	TREATMENT	OTHERS	WORK COMPLETED	
					PERM.	TEMP.	AM	CO AM	LG	SYN	OTHERS	CEM	COP CEM	GUTT	ZNO EUG	OTHERS					

Chart 2.

of an active and public-spirited Advisory Committee, made it possible to obtain the cooperation of component societies.

A. G. Ireland, M.D., Director of Physical and Health Education, with whom the Council on Mouth Hygiene has enjoyed years of cooperative effort, realized the advantage of assigning supervisory powers over the project to the State Dental Society. In this way, an advantageous organization was set up; school administrators, school nurses, health organizations, dental societies, all working together with one end in view—public health.

RECORDS

Form C.D. 6-25000, illustrated in Chart 2 was used for daily, weekly, and complete records of the operations performed. The regularity and reliability with which all reports were rendered was an indication of the effective or-

ganization and the generous cooperation of the personnel. By Saturday of each week it was possible to compile complete records of all the operations performed throughout the state.

CONCLUSION

In editorial comment, the New York *Times* stated in the issue of April 23, 1934: "As concerns projects, they should be adopted because of social usefulness. They should also be of such types as do not interfere with the labor market and such projects as can be carried on even during further employment."

Without doubt, the Children's Dentistry Project #6247 fulfilled these requirements.

The survey indicating dental conditions among school children and the promulgation of the dental health educational program will effect, to no little degree, an improvement in the concept concerning mouth health. Besides providing dental treatment for indigent school children, the project enabled communities and dental societies to consider the value of more permanent state-wide dental service programs. The Emergency Dental Relief Advisory Committee of the New Jersey State Dental Society has signified its willingness to cooperate in future programs designed to give relief to indigent children. Certainly these results may be considered of social value.

As only indigent children were treated, it can be stated with assurance that the project did not interfere with private practice.

It can, therefore, be truly said that the Children's Dentistry Project #6247 has performed a distinctive and monumental service to the State of New Jersey during a period of financial stress.

THE BUILDING AND UP-KEEP OF THE DENTAL MACHINE—A SYMPOSIUM*

MOUTH HEALTH AND GENERAL HEALTH

E. Melville Quinby, M.R.C.S., L.R.C.P., D.M.D., Boston, Mass.

A SUCCESSFUL issue to any project, however great or small, must depend, in the last analysis, upon the nature of man himself.

In the present instance an attempt is being made to establish the inception of measures which, if carried out in their entirety, may develop a much more satisfactory state of mouth health. This is "a consummation devoutly to be wished for"; but the first step toward accomplishment is the acquisition of an extended vision in our practice. Remember that, according to Carlyle, the measure of a man's success in life is in direct ratio with his power of vision.

If dentistry is to retain its prestige, it must like medicine represent all the measures necessary to render a health service to the community. We all know that with reference to the establishment of an all-satisfying dental education which will enable the dental practitioner to supply a real health service to the community, there are many conflicting opinions, and yet to the unprejudiced spectator it must appear strange that in the light of modern knowledge there should be any real question in the matter! The average layman seeking advice as to the condition of eye, nose, ear, heart, stomach, intestine, liver, kidney, larynx, bronchi or lungs, calls upon some recognized practitioner of medicine. On the other hand, a person with toothache or other dental trouble applies to a dentist who is a specialist in oral conditions; and yet, we must admit that the oral cavity is certainly a part of the body corporate; and inasmuch as the mouth is the entrance to two of the most important systems of the body, viz., respiratory and digestive, it is a most important part. Dr. Mayo is quoted as saying in September, 1930, that 61 per cent of the patients in the Mayo Clinic present themselves as a result of oral infection.

How can we justify the apparent anomaly in our practice?

It is common knowledge that the pioneers of the movement which led to the birth of dentistry did their best to have the child adopted by its logical parent, medicine! But the movement was unsuccessful; and the infant was sent forth into an unsympathetic world to seek out its own salvation.

As the pressing needs of the public—from the dental viewpoint—were relief from toothache and the acquisition of substitutes for lost teeth, natu-

*The symposium is based on the scheme of building, fitting and cleaning processes applicable to any machine, and the dental machine in particular. Given by the Dental Hygiene Council of Massachusetts at the annual meeting of the Massachusetts Dental Society, May 7, 1934.

rally the efforts of dentists at first were focussed on the attainment of mechanical skill in filling teeth and making artificial dentures. So far so good, but remember that in earlier times no one had ever heard of focal infection or oral sepsis; there was no radiography to guide one into the right path of diagnosis and treatment; in fact, the usual measure of success was the ability of the dental units to withstand the stress of an ideal method of preparation and reconstruction. For example, if the extent of decay was such that orthodox preparation for retention would endanger the vitality of the pulp, why then—destroy the pulp, usually with arsenic, fill the root more or *less,* and get all the retention necessary. Only twenty years ago this was considered right and proper.

TABLE I

EVALUATION OF THE THREE FACTORS ACCORDING TO AGE

	NUTRITION	OCCLUSION	HYGIENE
In prenatal stage	100	--	--
Birth—two years	90	5	5
Two—six	85	10	5
Six—sixteen	80	10	10
Sixteen—twenty-five	75	15	10
Twenty-five—forty-five	65	20	15
Forty-five—sixty	60	25	15
Sixty	50	25	25

Another example of what we know now to be a false doctrine was the status of a tooth which had been the cause of an alveolar abscess. If the abscess pointed on the gum, it was opened and very frequently left—because *it had been drained.* On the other hand, if the apical inflammation did not point on the gum, the tooth would be opened and left open, even to the extent of placing a little tube in the root canal, which acted like a chimney. The idea was to provide drainage, which was considered to be all that was necessary. If such a tooth gave no clinical symptoms, such as swelling and tenderness, it was left alone on the principle of letting sleeping dogs lie!

A time for awakening from this fancied dream of security came with the advent of William Hunter into the dental arena! Hunter in no uncertain terms denounced the habit of crowning and bridging teeth ad lib., and he described many gold crowns as gilded mausoleums, which, he claimed, were responsible for a train of sepsis which might, and did, invade the whole organism with fatal results. These diatribes of Hunter caused a painful sensation among the practitioners of dentistry, but in the end, after much initial resentment, were the cause of considerable house cleaning in dentistry.

Now the question that a conscientious dentist must ask himself is, whether in the recent advance of knowledge of bacteriology, pathology, biology, and endocrinology, he is justified in treating cases in the old-fashioned way when ignorance of recently established truths reigned supreme.

The question must be answered in the negative, and that being so we can see no alternative but a complete change in the plan of attack—a new point of view—and that means education of the dentist.

The medical profession for some considerable time has made frantic and praiseworthy effort to stem the tide of disease by preaching and practicing hygiene in many ways. Tuberculosis has been checked, as to mortality at least, 50 per cent; yellow fever has almost vanished; diphtheria has its antitoxin; and other diseases have been very much discounted. Most of these diseases, however, have been fought from the point of view of general hygiene. There is, however, a long list of ailments that for want of a more definite etiology have been tentatively and sometimes blindly ascribed to oral lesions—focal infection. The list includes many respiratory, intestinal, glandular, organic, arthritic, and eye and ear troubles. Such being the case, I strongly recommend that the medical schools extend their curriculum to include the pathology of the oral cavity, including, of course, a more intensive study of odontia and periodontia. Such a course would make it comparatively easy for the general practitioner in medicine to discover initial lesions in the oral cavity and, better still, to recognize normal tissues as distinguished from abnormal conditions. As it is, the physician leaves the study of oral hygiene to the dentist, and we know from sad experience that the average dental practitioner does not have time for more than the mechanical side of his work, with the result that the public suffers. This is not the viewpoint of a pessimist, unless we adopt the Galsworthian definition of pessimism, "the realization of facts as they are and a determination to rectify same." The following is an example of what we might call a vicious circle: e.g., the physician has a patient with obscure symptoms; as a last resort the patient is directed to the commercial x-ray laboratory. Films are prepared with an accompanying diagnosis—abscess! The physician, armed with this precious document, redirects the victim to the exodontist. The result is that many thousands of more or less useful units of the oral machine are lost, to the detriment of mastication and digestion, to say nothing of the development of periodontal lesions, which are directly attributable to such conditions of mutilation and subsequent neglect to supply scientific prosthetic substitutes.

But this is not all. The symptoms which led the patient to seek advice are in many cases not relieved by tooth extraction, making some other treatment necessary. This time perhaps the tonsils are suspected and removed; still no cure. Finally the seat of infection may be found in the appendix or gallbladder; treatment supplied and cure effected.

Such instances of haphazard diagnosis and treatment do not reflect much credit on the members of the healing art, and means should be taken so to improve and extend the preliminary training of medical and dental students that the great majority of practitioners would be incapable of making such mistakes.

The preservation or conservation of public health demands the cooperation of *physician, surgeon* and *dentist* to the highest degree. The large majority of the inhabitants of this country look to the general practitioner in medicine and the general practitioner in dentistry for advice and treatment in health matters. But under the present conditions of both medical and dental systems of education there is a loophole or hiatus which prevents a real conception

on the part of both medical and dental students as to their responsibility to the public well-being, more especially as regards diagnosis and treatment of oral lesions. For once let us leave out of consideration entirely the purely mechanical side of dentistry and focus on the other angles of oral medicine and surgery in their logical and inevitable connection with systemic conditions.

If it is true that the masses of the population are cared for by the general practitioner, medical and dental, it is obvious that the greatest amount of good can be obtained only through a thoroughly scientific and standardized education of the student. The medical or dental student who is to be a general practitioner of the future is taught by individual teachers who are specialists in their line; they have attained exceptional knowledge and skill in their branch and have little interest in any other subject.

All practitioners cannot be specialists, but there are certain fundamental principles in the science and practice of medicine, or the healing art, which should become common property so far as concerns the students.

In the Review of Clinical Stomatology, supplement to *Journal of Ophthalmology, Otology and Laryngology,* No. 2, Vol. 1, D. W. C. Shemeley says:

A PLAN OF PROCEDURE

BUILDING OR NUTRITION

	A. EDUCATIONAL		B. PRACTICAL	
A. Educational—by	Physicians Dentists Nurses Dental hygienists Social workers Health dept. School board	In	Public campaigns Lectures Motion pictures Newspapers Exhibits	
B. Practical Diet plan	Prenatal Birth—two Two—six Six—sixteen Sixteen—twenty-five	By	Physicians Dentists Dispensaries Clinics Schools	

Chart 1

"The realization of the need of closer cooperation between these specialists, viz., the ophthalmologist and otolaryngologist, naturally caused a greater familiarity with the various complications and sequelae that accompany various eye, ear, nose and throat conditions of dental origin and often the brilliant results of the institution of proper dental treatment."

There are many cases in practice in which it is difficult to say whether the patient should seek the advice of the stomatologist or the rhinologist, the laryngologist or the oculist in the first instance.

Again to quote Dr. Shemeley: "This brings up the question of the problem of preliminary education; suffice it to say that the fundamentals of dental diagnosis and far-reaching effects of uncorrected dental pathology should be an important part of every medical course of study. The effect of this will

be in the *early recognition of dental conditions by the general medical man.* With early recognition will come early treatment, which in time will produce better end-results, etc.''

With regard to the tackling of any problem, it may be suggested that no real solution can take place unless we divide the subject into four parts, viz., the whole, the parts, relation of parts to the whole, relation of parts to each other.

Thus we have the human machine as the whole, with all the component parts of the body in relation with the whole and with each other. The oral cavity and the dental machine are surely parts of the whole, and their interdependent relations must be considered together.

The same idea can be utilized in consideration of the dental machine—the whole in this case. The parts are the teeth and the supporting tissues. These are all interdependent in health and disease. It is impossible to do justice to the dental machine by simply focussing on teeth alone; from the point of view of either systemic or local treatment the supporting tissues must come into the picture. If they are left out then, for instance, the in-

ALIGNMENT OF PARTS

OCCLUSION

A. EDUCATIONAL — B. PRACTICAL

A. Educational
Early signs of malocclusion
- Bogue index
- Broken arch curve
- Lack of incisor separation
- Deviation of median line
- Excessive over-bite
- Open-bite (Delabarre)

B. Practical
- Diet
  - Mother—for development of tooth-tissue
  - Child—details in further chart
- Dental orthopedics
- Orthodontia
  - Malocclusion
  - Traumatic occlusion
- Exodontia

Chart 2.

cidence of pyorrhea is the likely result. As a matter of fact, that is just what happens in thousands of cases, and nothing has been done to prevent or alleviate it. Why?

To make a long story as short as possible, it is the object of this presentation to stimulate the logical use of measures which in a very large proportion of cases not only will tend to promote better mouth health and general health for the public, but will also undoubtedly lead to increased prosperity for the dentist. By examining and treating each mouth for restoration of health to the tissues and function to the masticating organ, every practitioner will find it necessary to do a great deal more. Coupled with the adoption of this in-

clusive conduct of affairs, should be an intensive education of the public along mouth health lines, because about one hundred million of the population know absolutely nothing of dentistry.

Two cases from the practice of Dr. Allen Greenwood of Boston:

On May 15, 1933, R. C., aged forty-three years, consulted one of Boston's leading oculists because of blurring of vision and a blind-spot in his left eye. These symptoms had developed within the past week, and the patient, who was himself an excellent oculist, had watched the appearance and the gradual enlargement of the blind-spot. Examination of the fundus showed a localized area of chorioretinitis which had undoubtedly recently developed above the optic nerve. The patient was told that his trouble was due to a focal infection and was advised to see his dentist. An abscessed tooth was found and

CLEANING AND REPAIR

ORAL HYGIENE = ANY MEASURE TAKEN TO BRING ABOUT A CONDITION OF HEALTHY ORAL TISSUE

- A. EDUCATIONAL
  - Creamy exudates on teeth: insoluble owing to coagulation of albuminous content of food by cooking.
  - Films or plaques: mucinous network, lime, salts, dead epithelium, putrefying and fermenting food particles.
  - Stains—black, yellow, green, red.
  - Calculus: salivary; serumal
  - Tongue
- B. PRACTICAL
  - Office—
    - Odontexesis at regular intervals
    - Toothbrush drill
    - Fissures: nitrate of silver; prophylactic odontotomy (Hyatt)
    - Cavity fillings
    - Orthopedics
    - Exodontia—infected teeth
  - Home—
    - Toothbrushes labial & lingual
    - Ribbon floss silk
    - Massage (gingival)
    - Mouthwash to suit individual
    - Prophylactic chart in bath room

Chart 3.

promptly extracted. Within forty-eight hours the vision became decidedly clearer and the size of the blind-spot decreased. Two weeks later the vision was normal, the blind-spot could not be demonstrated, and it was only with extreme difficulty that the previous area of inflammation in the retina could be found. The eye has remained perfectly normal since.

E. G., aged forty-one years, came to the office because of severe pain, redness, and impaired vision in his right eye. He was found to have an acute iritis and was given a very thorough physical examination. The tonsils had been removed several years before; the Wassermann was negative; and, in fact, all examinations were negative except for an abscessed tooth. Because

of previous experiences no difficulty was encountered in persuading the patient to have the tooth extracted. On three previous occasions during the past eleven years he had been relieved of attacks of acute iritis by the extraction of abscessed teeth. After the removal of the tooth during the present attack, the course of events was analogous to that in the first three attacks; the eye became more painful and the more congested about ten hours after the extraction, but soon the inflammation began to subside and within a week the patient was asymptomatic. This patient demonstrates very well how attacks of acute iritis are often relieved by the removal of abscessed teeth.

PUBLIC EDUCATION*

ELEANOR G. MCCARTHY, BOSTON, MASS.
Supervisor of Mouth Hygiene, Massachusetts Department of Public Health

THIS broad concept of Dr. Quinby's of the threefold approach to the problems of mouth health is the basis of our state-wide program of dental health education. Translated into the simplest of terms, it becomes the national slogan of "right food—see your dentist—and good daily care."

(A skillfully planned program of education *and* advertising, recently launched by the chewing gum interests, adds as a fourth factor, "chewing exercise." This, it seems to me, is unnecessary, except for selling purposes, as it has always been included in right food.)

This plan is a logical one for us to use, for it is the duty of the public health official to follow the weather vane of research and to protect individuals and organizations against what is both a national characteristic and a national fault—our tendency to seek a simple solution, a single cure, for the diseases that attack us; our inability to grasp the broad point of view that suggests the consideration of a combination of many factors simultaneously.

In planning a program of public education, it is all too easy to overemphasize the importance of filling pits and fissures, the value of regular toothbrushing, that is both tooth cleansing and gum massage, or the magic of the mineral and vitamin combinations in the arresting of decay. For example, we have at times, in our enthusiasm, overemphasized the four first permanent molars, until one would almost be led to think that were these alone saved, all would be well with the rest of the teeth.

In defense of all of those who have seemingly been temporarily misled into these bypaths, the following facts from the field of psychology should be considered:

First, to arrest the attention of large groups of people it is necessary that one fact at a time be presented from a number of points of view successively. For example, to teach the importance of milk to healthy teeth, we tell what milk contains, what teeth are made of, why milk is needed daily, about how much is needed, how other foods help the tooth-building cells to use milk and what happens to teeth when milk is not taken.

Then, to hold the public's interest, we illustrate the story; and to stamp in the facts, we repeat our illustrations over and over again.

Finally, to compel the response, to drink milk, we suggest the benefits to be derived in such a way that we supply proper motivation for the behavior desired.

*Given as part of a symposium, "The Building and Up-Keep of the Dental Machine," by the Dental Hygiene Council of Massachusetts at the annual meeting of the Massachusetts Dental Society, May 7, 1934.

All this means that the value of milk to teeth must perforce seem, and is, temporarily out of focus. We go thus from one factor to another, for only after the single factors have been learned is it possible to teach that a combination of these factors is necessary for mouth health.

We are rapidly approaching this stage in our educational program. For instance, Dr. Shirley Wynne, Commissioner of Health in New York City, in a recent campaign put on the billboards

FOR SOUND TEETH

Balanced Diet, including Vegetables, Fruits, Milk
Brush Teeth
Visit Dentist Regularly

To suggest the relative value of these various factors to the public is difficult because a series of facts should be learned in a certain sequence, if later you wish to emphasize them in that order—and the knowledge upon which we base our teaching is changing too constantly to make this possible. That is why we often find a feeling of distrust on the part of both lay and professional people, for it seems to them that we are constantly changing our tune. We even find some souls who say that until we settle to some definite course they will do little or nothing about their teeth. (I suspect, however, that behind this insistence on consistency of advice is the all too human failing of finding it easier to take a pill than to eat wisely, or "to have them all out" than to struggle to *get* and *give* the needed care.)

Behind this apparently changing front we are, through the vision and untiring efforts of our Dental Advisory Committee, working quietly and steadily for this general plan of nutrition, hygiene, and dentistry. It is used in several other states and, in my opinion, will soon be quite universal, for it fulfills the requirements of a public health program by including all factors now believed to be important in the prevention and cure of dental disease and is elastic enough to allow for the constant expansion of our knowledge. It does present certain difficulties, psychologically, and may, at the start, have to be presented one part at a time, but gradually the whole plan can be used as the "knowledge line" of the public rises.

If we turn to some of the projects now in progress in this state, we can see just how this plan is working. First of all, we find this *inclusive* point of view in the administration of our program—for example, in the rather unique membership of the Dental Advisory Committee that guides and directs the department policies and its plans. Starting with leaders in the dental profession, members have been added representing dental hygiene, nutrition, public health nursing, education, and pediatrics. As the promotion of dental health becomes more and more inseparable from that of general health, you can easily see the wisdom of such a combination in our guiding committee. A few examples of our activities will show how we are following along these three lines.

Dental Care.—First we stressed the care of pits and fissures in permanent teeth, reorganizing the working plan of the public dental clinics to start with

the lower grades and follow up the children, thereby increasing the efficiency of this service to needy children.

A little later we started dental educational service as part of the Department's demonstration Well-Child Conferences for *preschool* children. This carries the gospel of dental care for small children into rural communities.

Our Dental Certificate Plan that you are all familiar with, brings thousands of children, who were not going before, to dentists each year. Last year in Massachusetts 146,054 children received dental certificates—47 per cent of them went to clinics and 33 per cent to their own dentists.* This means that one out of every four of our elementary school children had dental care last year. What are we to do about the other three? Are we to assume that they are all clinic cases—or do we need to redouble our educational efforts? We all must face the fact that 367,532 children are without care—and do something about it. Do all you can to uphold the prestige of the dental certificate, for by it we may be able to reduce the need for more and more clinic service.

Hygiene.—Our program of consulting service includes the school and public health hygienists. Some of their programs include considerable prophylactic work; others are accomplishing splendid results entirely through education. Their goal in every case is, of course, to have the children keep their mouths clean. For example, the dental hygienist on the Southern Berkshire Health Unit (a demonstration health district of 16 towns financed by the Commonwealth Fund) reports approximately 92 per cent clean mouths as a result of her full-time inspection and educational program and the help given her by the teachers and nurses. There may have been some stain, but most of the school children in those rural towns are forming the habit of daily home care.

Nutrition.—Through our nutrition staff and our public health nursing staff we are teaching community nurses the newer knowledge of dental nutrition as it comes from the research laboratory through our advisory committee. These nurses reach the prospective mother and young parent often before the doctor or dentist does.

In our community organization work we are beginning to carry out much the same kind of dental nutrition service that Forsyth is now giving its patients.

In towns and cities where nutritionists are available for home visiting and individual conference work, we are planning for dental nutrition inspections of school and preschool children to screen out the cases of rampant and gingival caries. These cases will be referred to the nutritionists for follow-up. We hope to duplicate Forsyth's results in the lowering of the incidence of caries on a wide scale in the next few years.

Literature.—We have adopted New Jersey's slogan of "Every dentist's office a distributing center for dental health literature," and we are sending a copy of each new or revised leaflet to each dentist in the state. Ten per cent of the dental profession responded last fall to our first offer, ordering approximately 67,107 leaflets.

This plan for public education means much to every practicing dentist. It brings in patients; it increases their appreciation of the value of service he

*The other 20 per cent received certificates from the school dentist at time of examination.

renders; it helps to reduce dental disease; it makes his burden lighter and enables him to serve more people; it means carefully guided community programs which bring him into contact with the medical, nursing, nutrition and dental hygiene professions, and it protects his interests in the planning of clinic service. Literature from the department is reliable and conservative. Every dentist should keep a good supply on hand. It is his responsibility to keep his patients well informed and to protect them against the half-truths of the advertiser. I suggest the use of a shoe-bag type of holder in the waiting room.

If you find it difficult to keep in touch with the new developments in the nutrition field, you can always refer to this material. It has been carefully edited.

We, at the department, are servants of the people. The people are your patients. We can help you and we can help them through you. Expert professional advice and care are of little avail unless the people seek this advice and appreciate the need for and the value of the care. Working together we can bring the true story of dental health, not the garbled version now broadcast by commercial companies, into every home in the Commonwealth.

Education will go a long way toward overcoming the obstacles of poor inheritance, poor environment, poor habits, and poverty.

THE RESPONSIBILITY OF CHILDREN'S DENTISTRY FOR DENTAL HEALTH*

WALTER EMERSON BRIGGS, D.M.D., ATTLEBORO, MASS.

I KNOW of no better activity that the Dental Hygiene Council could focus its activity on than this newer thought of preventive dentistry, which has its best application in the promotion of dentistry for children.

Inasmuch as dentistry is engaged in one branch of the healing arts, it is therefore a part of the great health program. Our operations are confined to the oral cavity, which is the first four inches of the twenty-eight feet of alimentary tract. The quality of our work and the attention given this area must necessarily concern health. It is estimated that approximately 70 per cent of systemic disease enters the body through the mouth and the nose. If this be so, then a new responsibility of grave concern has been placed at our door. It gives a new meaning to the slogan, "A clean mouth, a healthy body."

During the span of life, 20 per cent of masticatory function is performed by the deciduous teeth. For many reasons their retention in good condition is essential, but with their neglect and the sequelae of malocclusion and abscess formation, there is introduced a real health problem of the child. Where can this service to our patients have a better start than in children? The filling of pit and fissure cavities is an investment in health; it pays good dividends.

A rapid development has grown up within the midst of dentistry itself, dental health service, beginning with better dentistry for children. An opportunity has come to dentistry to adapt itself to the new problem of the child.

Twenty-five years ago in most dental schools little or no thought was given to the importance of dentistry for children, and the child in the clinic was regarded as more or less of a nuisance. Is it any wonder then that today the profession as a whole has been slow to appreciate the importance of dentistry for children?

In the old days, with three years' training, we learned a lot about dentistry, after we left college, and children's dentistry was part of it. Just as much effort should be made to focus the attention of the student to the seriousness of children's dentistry as to the importance of making a fine gold foil filling.

The dental schools with their six-year program ought to provide an answer to the challenge of ever increasing dental disease by directing their efforts toward prevention early in the child's life. It is about three times as hard to work for children as for adults, and the training for this work should not be haphazard, but well directed. If more preventive work were done, there

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would be far less need of expensive restorations later in life. If this could be shown to the parents, more children would have dental work done, because the economic factor would appeal to them.

Only three years ago, many who were interested in advancing this phase of dentistry for children were discouraged by the general lack of interest shown, but happily the tide has turned, and from all sides the prospects are that the child is about to get not only a new deal but a square one. I doubt if ever there was a time when so much interest was being given to dentistry for children as at present. The idea is sweeping the country, and men and women who have the best interests of the profession at heart are behind this movement.

The section on dental health service recognizes its obligation to the profession and to the public. It is an attempt to convey to the public, information that it should have, as coming directly from organized dentistry. Our program is one of prevention and health. Dentistry is thinking along other lines than just mechanics, as shown by the following subjects:

"The Early Detection of Developmental Defects in Teeth."
"The End-Results of Neglect."
"Recognition of Factors Leading to Malocclusion: Necessity for Use of Space Maintainers: a Simplified Technic for Construction of Same."
"Pit and Fissure Cavities and Their Control."
"Relation Between Mouth Health and Systemic Health."
"Diet in Its Relation to Control of Dental Disease."
"Malocclusion and Trauma and the Effect on the Supporting Tissues."
"Relation of the Dental Arch to Rhinology."
"The Economics of Preventive Dentistry."
"The Use of Models for Educational Value."

It is our hope that the exhibit will create a better understanding of what dentistry has to offer in terms of health, to place the profession on a higher plane, and to create greater respect for its health program through preventive work. Remember that it is far better to prevent disease in childhood than to repair bodies broken in health later in life.

ORTHODONTIA'S RESPONSIBILITY FOR DENTAL HEALTH*

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THE basic purpose of orthodontia is the maintenance of function: first, through the elimination of the causes of malocclusion, or, second, its correction, primarily for the sake of health.

Oral function includes more than that of mastication, because other functions are performed by the tongue, lips, facial muscles, etc., namely, speech, swallowing, and expression. Nasal function is closely associated both in cause and in effect to oral function. A proper balance of all these functions is essential to each one.

Good function is an expression of life and health, and poor health results from poor function.

Efficient function is more essential in childhood, because of the demands for growth and development, than in adult life when it is needed only for the maintenance of the completed organism.

Malocclusion may be defined as any wrong relationship of the jaws and teeth. It always results in disturbances of function. It frequently appears in the incipient stages early in life, as small departures from the accepted course of growth and development, with a marked tendency to grow progressively worse, until at adolescence it becomes aggravated in form through the added complications, with a gross disturbance of the efficiency of function and a serious handicap to health.

The preventive approach to this problem, as in all matters of health, is logically productive of the best results.

Since it is a problem of growth and development, it should be applied to every child early in life with a systematic and periodic study of the whole child to estimate its physical and mental capacity and to recognize any existing handicaps or factors of adverse influence to normal physiologic processes. Careful records in the local field, such as yearly models, x-ray pictures, dates of eruption of the teeth, study of occlusion, habits, etc., should be correlated with other observations of evidence of health or disease in cooperation with the family physician if indicated.

If the suspicion of malocclusion grows into a positive diagnosis, treatment should not be delayed. Normal function, when restored, will tend to promote subsequent normal growth and development according to the succession of steps that characterize the unfolding of the hereditary pattern, appropriate to the ages up to maturity.

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Therein lies the greatest advantage of early treatment, far surpassing the attendant simplification of technical difficulties or even the better response to the stimulation for growth.

Normal occlusion and function are recognized as an integral and essential phase of the physiologic process of digestion, distribution, and assimilation of the daily intake of food.

The health of the mouth depends largely upon the dental care of the units, but if those same healthy units do not function well, the effort for general health cannot be wholly successful.

Orthodontia supplements all other dental attention.

A FEW PRACTICAL AIDS IN THE PREVENTION OF MALOCCLUSION*

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WE MEET as a profession to increase our knowledge that we may render a better service to our patients, believing that in so doing we may in equal proportion increase our income. One of the reasons for lack of interest in dentistry for children is our inability to obtain a proper return for the services rendered. This is directly the fault of the profession. To correct or relieve dental ills after they occur is a most expensive method. Fees for children must be in equal proportion to our fees for adults, as time gauged by the services rendered is really all that we have to sell. Children whose first dental visit is for the relief of pain are a liability in any practice. The removal of an aching deciduous tooth, which requires an hour of argument and persuasion and only a few moments of operative time, is a real expense to the dentist at the fee usually charged. There is only one sure method by which we may be able to render a proper and less expensive service to children and that is really to practice prevention. The time to see your little patients is several years before any service required could in any way be painful to them. This may only appeal to you as an ideal theory, but do not scoff at the suggestion until you give it a trial equal in time and effort to that which you now give to increasing your skill in, for example, your denture work. Probably 50 per cent of the dental service rendered today is for prosthetic restorations causing many comebacks for the eternal adjustments, which adds to the oversupply of our worries. Proper prevention will prove far more remunerative in every way. Several hundred children could be added to every practice, and the return therefrom would be more than from an equal amount of time devoted to denture work.

A misconception of orthodontic fees motivates many dentists to render orthodontic treatment. If our primary concern were the good we might do, we would surely not depend upon a mimeograph diagnosis from a commercial laboratory, which makes its deductions from plaster casts only, and whose probable worry is nil, because the appliances are constructed on a cash with order basis or C.O.D. Newspaper and circular advertising are today advising to your prospective denture patients that if they will follow instructions which will be sent upon the payment of five or ten dollars, they can take their own impressions and receive perfectly fitting dentures. Argument is not necessary to convince you that this is just another modern racket. Yet this applies equally to all orthodontic laboratories that may circularize you. Several so-called ethical dental journals have in the current month carried orthodontic ads that have no more right to be published than would a Peruna ad in the *Journal of the American Medical Association*. In the belief

*Read before the Texas State Dental Society, Fort Worth, April 24-26, 1934.

that most of us have the wrong viewpoint regarding orthodontic treatment, this preamble has been presented in the hope that I might interest you in a desire to study the possibilities of the prevention of malocclusion service and receive therefrom a financial return that will exceed many times that which you probably receive from a number of cases needing extended orthodontic treatment.

Real prevention to be of value and insure adequate returns makes it necessary to formulate a plan that will provide the required number of little patients. A yearly fee, paid in advance, and a definite understanding of what the service to be rendered includes, insures cooperation of the parents, with as many appointments as you may desire. Following the plan of having as many little patients as you can properly care for, may I partially outline a procedure to combat malocclusion:

Examine the occlusion with the teeth in contact. Normally there is a more pronounced overbite in the deciduous denture than in the permanent denture. This overbite will be less with the arrival of the permanent denture provided there is ample arch width, proper cuspal relation and if the child is a normal breather. As a practical everyday plan let us assume that there are three general types of malocclusion: one with the mandibular arch distal, or we may term it receding; another type with the mandibular arch too far forward; and one with the posterior teeth in apparently normal relation but with the arches underdeveloped. The latter condition is not so apparent in the deciduous denture, unless you are carefully watching for this type, but it becomes more noticeable with the arrival of the permanent dentition.

Assuredly there are many variations and combinations of these general types, but I am only attempting to outline a simple procedure for you at this time. Keep these general types in mind as a basis in looking for trouble with these little patients. We have not the time nor have I any desire to attempt to outline the very many and exceedingly complicated theories on diagnosis of malocclusion. One of the main reasons for the lack of interest in orthodontic treatment by members of the profession is that they have often had presented to them many fads and fallacies on diagnosis. Your main concern with children from three to ten years of age is to aid them to become healthy growing children, through proper care of and advice regarding their dental apparatus.

Naturally you will make a careful examination for decay or any abnormal condition of the supporting tissues. After the second or third visit you will be able to give a proper prophylaxis. It will then be easy to make simple compound impressions. You then have something, not only for future reference, but also to prove or disprove the statement too often made to the parent, "Do not worry about your child's teeth as nature will fix everything all right in due time." As early as the fourth year begin keeping a record of the palatal width. Let us hope that the palatal width between the first deciduous molars is, or exceeds, 28 mm. by the fourth or fifth year. Make measurements at least every six months, and jot down the width and date on the model for future use. Some men attempt to discredit the value of arch width, yet I

note that they later try to gain more than this through treatment. Apparently they forget that it is the occasional exception that makes possible the elasticity of all rules.

Failure to have the desired width or at least some indication that it is increasing, causes us to look elsewhere for trouble. For example we may have a decidedly underdeveloped child physically, an abnormal breather or an absence of growth spacing of the deciduous incisors. Regardless of the pro and con arguments of the value of spacing of the incisors, the fact remains that healthy growing, normal breathing children who really use their teeth to masticate their food do, in a vast majority of cases, have the desired arch width and spacing. Most of the exceptions are those having congenitally missing permanent lateral incisors, and we are already aware of this if we have made at this time a complete dental x-ray examination, which I consider vitally necessary. At once I hear your mental comment that this is unnecessary and an expensive luxury. Frankly I doubt whether any future x-ray pictures made for this patient will reveal as much information or be of equal aid in preventing or eliminating trouble. Bite-wing films are often ample. To those who may believe that prevention is an expensive procedure, may I suggest that you will be able to follow the simple outline that I am giving and in addition give the necessary prophylaxis, make study models and x-ray pictures and also remove the deciduous teeth as indicated for a fee of five or ten dollars per year per patient, depending upon your location, and be well paid for your time, as a majority of these patients will need an equal amount of other dental work. Equally important, the time saved with properly handled little patients will give you many extra productive hours. I am not trying to get you to do the preliminary advance work for the orthodontist, gratis, but I am trying to get you to stop treating cases under the direction and advice of the commercial laboratory mechanic. Many such cases are being treated by the family dentist with the excuse that he feels that it is his duty to try to do something for these patients who cannot afford to go to a specialist. Let us be frank about this matter and admit that a major portion of these cases are being treated because it appears to be a good return on the investment made for the appliance. If we are truly sincere in our desire to aid children who cannot afford proper orthodontic treatment, let each of us try to prevent a certain amount of malocclusion by helping several hundred children with the often misplaced effort and time that we are giving to a few patients and be better paid for it.

The lack of proper attention to the removal and retention of the deciduous teeth probably causes as much malocclusion as any other one thing that may be mentioned. The family dentist can and must do more to aid in correcting this condition. The deciduous teeth should be lost or removed in the same order that they erupt. Beginning with the central incisors the teeth should be lost in pairs, those in the mandibular arch a few weeks before the corresponding or opposing teeth in the maxillary arch are lost or removed. The removal continues from the central incisors, skipping the canines which are lost after or approximately at the same time as the second deciduous molars.

The permanent teeth erupt in the same order as the deciduous teeth, the former by a fairly definite schedule of years, the latter by about the same ratio in months. Observing the deciduous teeth is a helpful aid in planning for the arrival of the permanent denture as individuals vary greatly. Never remove an approximating tooth to make space for an erupting permanent tooth unless it be the extracted tooth's normal successor. The most frequent error made is the removal of the deciduous canine, or permitting it to be prematurely lost, especially in the mandibular arch, to give added space for the erupting lateral incisor. Age of patient or rigidity of the deciduous tooth should not positively determine the time of removal of any deciduous tooth. One or two x-ray pictures definitely answer the question, and by comparing them with the originals this simple procedure may, more often than not, be the deciding factor in aiding proper eruption and avoiding a positive malocclusion. Excessive or complicated malocclusions are not produced in a few months' time but do often arise from very simple beginnings. Let us discuss a very common condition in a little patient about eight years of age. The permanent mandibular incisors are crowded, probably there is space for three or three and one-half incisors. Because of the undeveloped arch the erupting lateral incisor and the erupting first premolar have prematurely caused partial or complete absorption of the root of the deciduous canine causing its premature loss. Timely removal of the first deciduous molar, the need of which can be positively determined by the x-ray examination, would have prevented this. Removal of the deciduous molar would have permitted the deciduous canine to drift slightly laterally giving ample space for the erupting incisor. The premolar often being smaller than the deciduous molar, will have ample space and will normally gain added space as it erupts. The main thing is that we would have retained the deciduous canine and thereby space for the permanent canine. If you may think that this is a lot of complicated talk and useless worry over the loss of a deciduous tooth, let me remind you that the untimely loss of this tooth permits the permanent incisors to drift distally or to retrude, and often permits the posterior teeth to drift forward on that side, as the main support of the angle of the arch has been lost. About the eleventh year the orthodontist is censured because he outlines a complicated plan of treatment, apparently for a supposedly large fee. Nature has been forced through this premature loss of the deciduous canine to make a misguided effort to make the arches fit, with the result that probably some fifteen teeth have drifted out of normal position. This condition must be corrected if the final result is to be of any value whatsoever. Probably all or at least 75 per cent of the trouble could have been prevented; surely this makes the suggested x-ray examination inexpensive and of a decided value. We may continue to give little attention to prevention, but when we realize that probably from 60 per cent to 80 per cent of all the cases now undergoing extended orthodontic treatment could have been materially aided through early prevention, we should be aware of the effects of our blissful ignorance. Because we do not use our teeth as it was intended, it appears that the mandibular arch more often needs aid by timely removal of the deciduous molars thereby assisting vertical growth. Correction of the overbite, which may be normal

in the deciduous denture, is not assisted to any great extent with the replacement of the incisors; but it is corrected as vertical growth of the arch occurs; and vertical growth, which is as vitally necessary as lateral growth, is often retarded by too long retention of the deciduous molars. Very often only one root of a deciduous molar is absorbed. The x-ray picture again comes to your aid.

Space retention is another phase of prevention that is so often neglected, unapplied and misunderstood. The orthodontist so often fails to see the patients who need space retention until it is too late. A great number of malocclusions are caused because of the failure to apply this safety guard in time. The placing of a space retainer depends upon several conditions, and most of them are disclosed by the often mentioned x-ray examination. The most frequent need is to retain the space of a prematurely lost second deciduous molar. Next in the order of importance are the first deciduous molar and canine. Retention of space for a permanent incisor is seldom necessary. A space retainer should not be placed if the replacement tooth will soon erupt into position, nor should one be placed when a posterior permanent tooth is congenitally missing. It is generally a safe practice to close the spaces of missing posterior permanent teeth and to retain the space of missing permanent incisors. Space retainers should have only one fixed point of attachment; otherwise normal growth is retarded. The anchor band should be placed upon a deciduous tooth whenever it is possible to do so. A partially erupted tooth should never be used for the attachment of a retainer. To retain the space of a missing or lost permanent incisor it is probably good practice to use vulcanite, a partial plate, until such time as an artificial restoration can be made. Complicated clasp removable plates very often become active orthodontic appliances.

Habits which interfere with normal growth to any degree should be eliminated. Lip biting, thumb- and finger-sucking are the most common. Mouth-breathing cannot be classed as just a habit. Considerable difficulty may be experienced in eliminating a habit, but when failure occurs, I find that with very few exceptions it is because of lack of effort on the part of the parents regardless of the claims that they make. While mouth-breathing may become partly a habit, it is the result of a mechanical or pathologic interference. The ill-effects that may result from abnormal breathing have furnished a topic for many pro and con discussions. Some members of the medical profession and a few of the dental profession have made the statement that mouth-breathing made no material difference in arch form or arch growth. Howard inferred that arch form was similar in both normal and abnormal breathers. His report showed that he depended upon the patients' statement as to how they breathed. I have examined children having short upper lips, underdeveloped nares, narrow arches, and a very marked tendency to maxillary protrusion, whose mothers would make very positive statements that their children did not breathe through their mouths. Continuing the examination I would indirectly cover the child's mouth yet permit it to breathe through its nose and without exception I have yet to find one that could do so without great effort or discomfort. Depending upon patients or parents

for positive information upon which we make positive statement is a very poor method. With a far better foundation for facts Balyeat recently pointed out that all children with allergic diseases, who assuredly are not normal breathers, had in all cases high, narrow maxillary arches with some degree of protrusion of the incisors. We need not overcomplicate matters by arguing how nature intended for us to breathe. The ratio of improvement from orthodontic treatment with this type of case can be accurately gauged and is in direct proportion to the improved approach toward normal breathing. A normal breather at three or four years of age is to be desired in preference to an abnormal breather twelve years of age who will positively need and may seek orthodontic aid. If the future dental health of the children in your practice is a part of your responsibility, then it is your duty to advise and insist that a proper examination be made in all cases where you suspect any nasal obstruction or trouble. Your responsibility ceases only after you have pointed out exactly what the future holds for the abnormal breather. There are many helpful aids to promote nasal breathing. There is an upper lip exercise that if properly followed will gain worthwhile results. A narrow strip of adhesive tape placed vertically across the center of the lips at night will in a few months do great good. A very efficient cap with a chin support and with an additional soft pad across the mouth is now available. Do not attempt to close the mouth completely with tape or otherwise until the child breathes at least 50 per cent normally. Following the removal of any nasal obstruction, such as adenoids, the little patient should be instructed to try to breathe normally, having a set time for daily deep breathing exercises. Such instructions should be, but seldom are, given to the patient by the rhinologist. We must remember that regardless of the ease by which teeth may be moved into desired positions, we cannot expect them to remain as desired unless normal function of the supporting and surrounding tissues is established, which must be compatible with and to the teeth in their new positions. An appliance, no matter how efficient, does not answer the orthodontic problem, nor will any special system or method do so regardless of the advertising statements to the contrary.

Just a word of warning regarding the frenum labium. The space between the permanent central incisors will with few exceptions close with the arrival of the lateral incisors and canines. Seldom need you be alarmed about an excess of space between any teeth in a developing arch, provided the x-ray pictures have shown that there is not a supernumerary tooth present. More often than not more space than is then present will be needed. Keep these frenum cases under observation for a few years; and as the permanent teeth continue to erupt and move away from the alveolar crest, you will be agreeably surprised with the apparently new position of the frenum labium. The surgical removal of the frenum is indicated only when after a sufficient period of observation you are definitely assured that it is increasing in size, and that the position of the central incisors positively indicates that there is tension between them. You may partially determine this by raising the lip and by placing tension on the frenum deplete the tissue not only between the central incisors but also over the palatine foramen. The excess amount of

space between the central incisors should not cause any worry unless the x-ray pictures show that the permanent lateral incisors are missing. Do not close this space with small rubber elastics. This method will do more harm than good. The movement is too rapid and often permanently injures the gingival tissue. Cases that may be closed by this method would close in ample time without assistance.

Even if I may convince you that a definite amount of malocclusion may be prevented, I am not optimistic enough to believe that all malocclusions can be prevented. I would rather have you believe that the combined efforts of the members of this Society will help many children who otherwise would never receive any attention from an orthodontic standpoint, and for such service the members would receive a fair return, also that many who in spite of such assistance may later need treatment, would, perchance, need less of it. The ideal practice for both the family dentist and the orthodontist would be one of mutual cooperation, whereby all patients who might later need treatment would also have had the benefit of careful observation for a number of years before treatment was deemed necessary. You cannot devote the major portion of your working hours to referring cases for treatment, nor can you really render a proper service to your little patients unless you correctly advise them. This can be done much better than it is being done at present, and while being paid for it, one can build a desirable practice. I have noticed that a majority of those that have been in practice for twenty years or more have a practice that consists of about 75 per cent denture work. They have failed to hold the children of their long-time patients. Why? I have often had children under treatment before their dentist was aware of it. Most of them were there because of the failure to correct some simple condition a few years earlier. I know full well from experience of the difficulties of working for children in general practice if you have not built up the proper approach. But if you will take the trouble to speak their language, think as they think, you will have ideal patients. The first few visits should not take but a few minutes of your time if you have previously instructed the parent. You must first get acquainted before anything can be accomplished. Do not be too ready to assure the parent that everything is and will be all right. Far better to impress them with the fact that it will be only by regular visits that you may be able to give such assurance. Never be guilty of advising a parent that the ideal time to have an anomaly corrected is from twelve to fourteen years of age.

Any attempt to promote and practice prevention means that we must make a radical change in our present procedure. First, we must overcome the handicap of delay in having the little patients make their first visit to us. Second, we must provide a sure way to secure regular future visits. Third, the fee must be fair not only to the patient but also to us. Desired cooperation of the parents can only be assured when you can make them a definite yearly fee, and you cannot make them a definite fee unless you have volume, and you cannot handle volume unless you can have your little patients for several visits *before* they have had any dental pain. Most children as they

are handled today could not be profitably treated according to the time now required for several times a fee that would be ample for a properly started and handled child.

There are of course many additional possibilities for prevention of malocclusion. The few mentioned here are offered with the hope of causing you to study the problem.

Dr. McFall has pointed out and will continue to point out many additional aids for the prevention of future dental ills. Naturally I am very appreciative of this opportunity to enter into a discussion of prevention. I must not fail to mention that the INTERNATIONAL JOURNAL OF ORTHODONTIA AND DENTISTRY FOR CHILDREN is without a doubt presenting in each issue more information on dentistry for children than appears in all other dental journals combined.

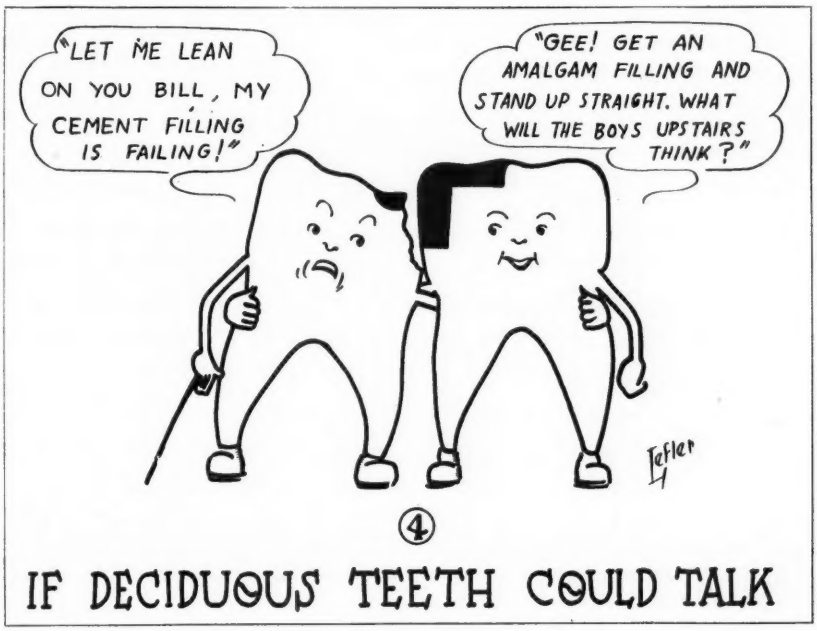
In conclusion, there is one definite fact that I hope to leave with you: Prevention of malocclusion is not a special or self-acquired right of those who may limit their practice to orthodontia, but it is the duty of the entire dental profession. If dentistry were properly practiced, many children would be assisted toward a healthier and a happier future, and it should be readily apparent that many cases which are now referred for treatment would not have been hopeless or borderline cases.

IF DECIDUOUS TEETH COULD TALK

HARRY B. SHAFER, D.D.S., ANNA, ILL.

DENTISTS friendly to the cause of pedodontia make great sacrifices of time and money in order to educate parents concerning the importance of retaining the deciduous molars.

Perhaps at a meeting of the parent-teachers' association the mother becomes fired with enthusiasm and immediately seeks more advice from the family dentist.



The first appointment for the child is an important event for three reasons: (1) the little patient will form an opinion of dentistry; (2) the mother must be impressed with the importance of good substantial fillings; and (3) the dentist should add another name to his list of juvenile patients.

A good way for the dentist to fail is to insert a poor cement filling carelessly. The child is sure to return in a short time with a toothache, the molar leaning on its next-door neighbor, and the occlusion destroyed. Why not place a good amalgam filling with a contact point? The tooth then will stand up straight, and the patient's confidence will be established.

Department of Orthodontic Abstracts and Reviews

Edited by

DRS. EGON NEUSTADT AND JOSEPH D. EBY, NEW YORK CITY

All communications concerning further information about abstracted material and the acceptance of articles or books for consideration in this department should be addressed to Dr. Egon Neustadt, 133 East Fifty-Eighth Street, New York City.

Rustless Iron. Abstracted from: Ein Stück Metallkunde, by Richard Schulz. Zeitschrift für Zahntechnik und Zahnheilkunde, May–June, 1934, Wien.

The introduction of stainless steel into dentistry has been well received on account of its outstanding physical and chemical qualities. But when we tie the shiny ligatures around our patient's teeth, we should not forget that basic substance of stainless steel: rustless iron.

Chemically pure iron (Fe) has some qualities which are not known to everybody. First of all, it does not rust. After many thousand years of endeavor, modern chemistry has finally succeeded in producing iron which really is iron. This material does not possess that characteristic quality which hardly seems possible to dissociate from iron, namely, rusting.

This problem was first discussed between chemists and archeologists in a study of old Indian foundry works. Near Delhi, in India, there exists one of the most gigantic remnants of old Indian iron industry, the Kutub column. It is over 22 feet high and weighs more than 12,000 pounds. It is forged from one piece. From an inscription it appears that the column was made in the ninth century B.C.

Despite its high age, not a trace of rust can be seen on the Kutub column. This is more remarkable as the damp and warm climate would facilitate rusting. How can this phenomenon be explained?

An analysis of the iron used in the column showed that it was of a purity unattainable in the present-day foundry methods of iron production. The thought was conceived that the high purity of the iron caused its rustlessness. Rusting, therefore, is not a quality of iron itself, but of the impurities contained in commercially produced iron.

Many years after this discovery, two American chemists succeeded in producing, through electrolytical methods, iron of 99.9 per cent purity. This iron is very similar to platinum. It is used by jewelers for watch chains, stone mountings, and bracelets. The platinum color makes it suitable for these purposes, and also the fact that, even under the influence of skin perspiration, it does not rust.

E. N.

THE FORUM

With enthusiasm for the cause, yet with misgivings as to our fitness, we have agreed to conduct a Forum in this Journal as announced by the Editor.

Dental journals in general, and this one in particular, have a plenitude of fine articles, largely scientific in character, covering almost every phase of orthodontia and children's dentistry. It sometimes happens, however, that some particular point in an article is not clear to one individual, or that some one would like to take exception to a statement or theory in a given article. The Forum will provide a place for asking questions about a point that is not clear and for explaining why exceptions are taken to a statement or statements in a published article.

The Forum will also provide a place for a more informal discussion of any subject than is possible in a scientific paper.

We, the Editors of the Forum, therefore invite any and all members of the profession to use this department for the free discussion of anything related to orthodontia or children's dentistry.

A. H. K. and W. R. H.

X-ray Examination in Orthodontia

If the orthodontist treated only the erupted crowns of teeth, his need for x-ray examination would not be so urgent. Even so, it would still be desirable; for many a carious nick in the approximal enamel, which might have been discovered radiographically, has been covered with an orthodontic band and the band later blamed for making the tooth decay.

The orthodontist's interest and work, however, go beyond the erupted crowns of teeth; he is just as much interested in the roots and the jaws, or he should be. That he should not even condescend to look at the thing he expects to operate on is almost unbelievable.

If he is concerned with the jaws and all the teeth, then surely the examination should be complete and include the jaws and all the teeth. It should not be restricted to certain selected regions; nor should it be inadequate because of technical ineptitude.

Just exactly what constitutes a thorough examination differs with different cases. Broadly, there are at our disposal the following types of x-ray examination: (1) intraoral periapical, (2) bite-wing, (3) occlusal, (4) extraoral. There is much to be said in favor of each of these types. They should all be used at different times. They are the means to an end, the end being to give a view of all that the orthodontist should see.

Nor is thorough preliminary x-ray examination sufficient. Very much may be learned by periodic observation. Radiodontic examination has been in general use long enough now so that we have seen most of the surprising and stimulating things it has to reveal, but many surprises and much new and valuable knowledge will come to the men who have the patience and the wisdom to keep cases under observation over a period of years. In this connection I wish to offer my congratulations and express my gratitude to Dr. Albert H. Ketcham. Dr. Ketcham's radiodontic files carrying his cases over a period of years have taught him and others, including myself, things that could not have been learned in any other way.

Howard R. Raper.

What About "Hand Me Down" Orthodontia?

My attention has been called to the commercial laboratory or/and "mail order" type of orthodontia that has come into the light of day rather recently, and I should like through the courtesy of this Journal to express my opinion, as a dental diagnostician, about the matter.

The dental profession has come to a realization of the importance and even the necessity of a careful and complete diagnosis as a prerequisite to the successful treatment of dental lesions.

Orthodontists have recognized the necessity of a preoperative diagnosis earlier and more universally than have dentists in general practice. I believe this accounts, in a large part, for the enviable position among dental specialties now occupied by orthodontia.

Irreparable damage is almost certatin to result if a dentist fails to precede reconstructive operations by a careful diagnosis; but the damage done by an orthodontist if a careful diagnosis is not made before treatment is undertaken will inevitably be more serious, for he is liable to ruin a whole denture as compared to the ruin of perhaps one or two teeth by the dentist.

The only guide the laboratory has in making "mail order" orthodontic appliances is a plaster model. How can the condition of alveolar bone, size and shape of tooth roots, height, weight, health, facial lineaments, inherited tendencies, disposition, habits, home influences, and many other things important to the success of an orthodontic case, be known from a plaster model? They just can't be. Therefore "mail order" orthodontia should be decried and abandoned by the dental profession, for anything less than the most skillful orthodontia would be much worse for the patient than no orthodontia at all.

George R. Warner.

Chrome Alloy

Sufficient time has elapsed since chrome alloy was first introduced to the specialties of prosthodontia and orthodontia to prove beyond a doubt that the tissues of the mouth can tolerate this metal equally as well as it can alloys of gold and platinum. To emphasize this point we call your attention to the usage of 18-8 chrome wire as sutures in facial surgery.

Stainless steel 18-8 has the widest range of application and under ordinary conditions has ample corrosive resistance qualities. Regular 18-8 when exposed to heats between 1,200 and 1,400 degrees loses some of its corrosive resistance qualities, and intergranular corrosion may occur adjacent to soldered or welded areas. This fault can positively be corrected by adding titanium to the alloy. This is called stabilization. Therefore, when heat is applied by welding or soldering, we advise the use of U. S. S. Stabilized 18-8 to avoid any possibility of breaking down of the grain boundaries.

The disadvantages of U. S. S. Stabilized 18-8 are the failure of soldered unions and the fact that being an austenite it cannot be heat treated. U. S. S. Stabilized 18-8 is very low in heat and electrical conductivity. This resistance to electric current makes 18-8 ideal for spot welding, which is absolutely a permanent method of joining stainless steel. After one masters the spot-welding technic, one will never again return to soldering because spot welding is much faster, cleaner, easier, and cheaper than soldering.

The new vogue of railroad and airplane construction is spot-welded stainless steel bodies. No rivets or bolts are used in the body construction. Beams and supports have flanges of lateral extensions and are spot welded in much the same manner as we weld flange tubes to bands.

When U. S. S. Stabilized 18-8 is softened by the use of too much heat, the temper can be restored only by cold working; therefore, annealing of these arches should be avoided, which can be successfully done by working in the range of temperatures up to 1,600 degrees, which is the annealing point.

The advantages of U. S. S. Stabilized 18-8 in orthodontia are many. From the standpoint of permanence, when subjected to exposure, it is comparable to gold and platinum. It is stronger and tougher than gold, and its extreme hardness prevents marring of appliances. It will not fatigue, and its physical properties are such that its tensile strength, elasticity and springiness exceed those of any of the alloys of gold and platinum. The cleanliness of the metal alone is worthy of its use in the mouth. It will not tarnish, and with normal brushing the appliances will remain bright throughout the period of treatment.

U. S. S. Stabilized 18-8 can be successfully used in orthodontia with the application of proper technic.

Archie Brusse and J. Lyndon Carman.

Counting the Cost

Do we know what it costs to treat an orthodontia case? Here are some thoughts to consider:

Have we computed our capital stock? What is the cost of a dental and orthodontic education? (What might one earn at a modest salary during one's college years?) What is the cost of our office equipment? What is our net income? Are we charging against our net income each year a portion of the cost of our professional education plus interest? Are we charging off each year not less than 10 per cent of the cost of our office equipment? Are we laying aside

each year a certain amount for the purchase of new equipment? Are we charging against our income the expense of attending dental meetings and of post-graduate instruction?

Do we keep a record of the total hours per year that we are busily engaged in our office? Do we know how many of these hours are unproductive as to income? (In other words, how many hours are we giving away?) Are we not actually surprised, if not alarmed, how few are the productive hours as compared with the total number of working hours in our office?

Do we know the cost of the materials used on each orthodontic case? Do we know the office overhead of each productive hour? Do we know how many hours we have spent on each case? Have we computed this cost? Are we not surprised also at the relatively small cost of the materials to the total cost of the case? Do we owe more to our patients to forget these items when making a fee, or do we owe more to ourselves and our families to think this economic problem through?

When does our responsibility to a patient end? When we have all the teeth in normal relation with those in the same arch and those in the opposing arch? Or does it continue through the developmental changes of the second and third molar periods? In what percentage of cases has our diagnosis failed to recognize the "unforeseen" which eventually prolonged treatment and expense? Do we take this into consideration when making our fee? Do we realize that our responsibility does not end with the active period of treatment?

Apply these principles of economics to the practice of orthodontia.

William E. Flesher.

International Journal of Orthodontia and Dentistry for Children

PUBLISHED THE FIFTEENTH OF EVERY MONTH BY

THE C. V. MOSBY CO., 3523-25 Pine Blvd., St. Louis, Mo.

Foreign Depots—*Great Britain*—Henry Kimpton, 263 High Holborn, London, W. C.; *Australasia*—Stirling & Co., 317 Collins Street, Modern Chambers, Melbourne; *India*—"Practical Medicine," Egerton Street, Delhi; *Porto Rico*—Pedro C. Timothee, Rafael Cordero 68, San Juan, P. R.

Subscription Rates—Single Copies, 75 cents. To any place in United States, Cuba, Porto Rico, Canal Zone, Mexico, Hawaii and Philippine Islands, $7.00 per year in advance. Under foreign postage, $7.40. Volume begins with January and ends with December of each year.

Remittances—Remittances for subscriptions should be made by check, draft, post office or express money order, payable to the publishers, The C. V. Mosby Company.

Contributions—The editor will be pleased to consider the publication of original communications of merit on orthodontic and allied subjects, which must be contributed solely to this Journal.

Opinions—Neither the editor nor the publisher holds himself responsible for the opinions of contributors, nor are they responsible for other than editorial statements.

Reprints—The publishers will communicate with authors regarding reprints upon publication of paper.

Communications—Contributed articles, illustrations, letters, books for review, and all other matter pertaining to the editorial department should be addressed to the Editor, Dr. H. C. Pollock, 4482 Washington Blvd., St. Louis, Mo. All communications in regard to advertising, subscriptions, change of address, etc., should be addressed to the publishers, The C. V. Mosby Company, 3523-25 Pine Blvd., St. Louis, Mo.

Illustrations—Such half-tones and zinc etchings as in the judgment of the editor are necessary to illustrate articles will be furnished when photographs or drawings are supplied by the authors of said articles.

Advertisements — Objectionable advertisements will not be accepted for publication in this Journal. Forms close first of month preceding date of issue. Advertising rates and sizes on application.

Change of Address—The publishers should be advised of change of subscriber's address about fifteen days before date of issue with both new and old addresses given.

Nonreceipt of Copies—Complaints for nonreceipt of copies or requests for extra numbers must be received on or before the fifteenth of the month of publication; otherwise the supply may be exhausted.

Entered at the Post Office at St. Louis, Mo., as Second-Class Matter

EDITORIALS

The Forum

THE INTERNATIONAL JOURNAL OF ORTHODONTIA AND DENTISTRY FOR CHILDREN is pleased to announce to its readers that it is adding another department within its pages, which it is hoped will serve as a Forum, or focal point, for the discussion of practical problems confronting the man who practices orthodontia or dentistry for children.

To head this department, the Journal has fortunately secured the cooperation and services of Dr. Albert H. Ketcham and Dr. William R. Humphrey of Denver, Colorado. Doctor Ketcham needs no introduction to our readers or, for that matter, to orthodontists in any part of the world. He has written and contributed voluminously to the literature and to the science of orthodontia for

the past thirty years. He is generally regarded and numbered among the pioneers of the specialty and enjoys the respect, good will, and confidence of orthodontists everywhere. Doctor Ketcham will be ably assisted by Doctor Humphrey, who has been associated with him for fifteen years. These Editors will be glad to receive communications direct from the readers and friends of orthodontia everywhere pertaining to subjects for informal discussion within the pages of this Journal.

The INTERNATIONAL JOURNAL OF ORTHODONTIA AND DENTISTRY FOR CHILDREN believes that this department will be of practical value to workers in this field whose experience has not possibly been so broad as that of others. The Journal welcomes these men to its staff as contributors to the interest and advancement of the specialties.

H. C. P.

Changing Scenery

THE recent economic flurry through which people are trying to emerge in the best condition possible, both physically and financially, has made slim pocketbooks the usual and customary thing. Luxuries have been abandoned, and, in like manner, necessities are being neglected more and more. As the intensity of the economic situation continues, professional men, unfortunately, are learning much to their regret and surprise that one of the first things to be abandoned by people in financial difficulties is their demand for professional service, that is, particularly the kind which is not for a definite emergency or for relieving pain.

It is being said and printed repeatedly that the man who deals with human life or any phase of medical attention should accept his duties as a trust; that whether or not he makes money should have nothing at all to do with this trust; and that if the money question becomes involved to an important degree, then the trust is wrongly placed and he should direct his attentions to activities of the mart, to farming, to raising live stock, or some other occupation in which the making of money is the all-important inspiration.

When whole villages and towns discovered that by purchasing several carloads of coal and corn they could materially reduce the cost of coal and corn for each individual and that each person would be amply supplied with these necessities for the winter, the idea was also born that medical service may be and should be supplied on a socialistic basis. If medical service and certain departments of dental service, however, do become cooperative and come within the reach of every one, health should show a rising scale.

Orthodontists, as a class, particularly are realizing that their type of professional work is of such a nature that a holiday may be declared during such times as the present. The work is unlike that in other departments of either medical or dental practice in that there is no urgent emergency to make patients rush to the office for relief from pain. As far as that is concerned, Johnnie can continue to have "crooked teeth"; his father received no attention of that kind when he was a boy, and anyhow what's a crooked tooth more or less in this life's

affairs? This type of reasoning at least solves the problem for the present during the pressure of the depression.

Perhaps the general medical system may ultimately reach the goal advocated by some, when expert medical service will be available to every one at prices within the reach of all. There can be but little cause for anxiety that such sweeping socialistic changes will take place in the near future in orthodontia because of the very nature of the specialty. Dentistry is concerned largely with disease and repair. Orthodontia in contrast is concerned with the development and growth of the maxillary organs of the body and is largely in concept a biological proposition, and the orthodontist's duty is to supervise the development of the architecture of the dental organs. There are great fundamental changes taking place, right now before our eyes in the economic and social aspects of the practice of orthodontia, and these changes are occurring so rapidly and the scenery is shifting so quickly that one hardly realizes what is happening.

More substantial and simpler technic is being perfected to enable the orthodontist to be surer of the progress of his case and to see his patients with longer intervals of time between visits. Since the advance of the biological concept, it is customary to treat cases on the basis of growth, which means that the orthodontist does not believe his treatment must consist of mechanical devices placed in the mouth and maintained there at all costs *to the bitter end.* Many orthodontists now have a shorter time for active treatment and use retainers which do not interfere with the normal growth of tissue; then they supervise, check, and take up treatment as or when they deem it necessary—if it is necessary at all.

Much effort is being made in many quarters to simplify treatment as much as possible by the development of a skillful technic and the elimination of complex and unnecessary steps in treatment, and great deal of progress has been made. If the specialty has ever enjoyed a reputation for providing a professional service for the upper classes of society only, that reputation is passing, as it should in any important scientific calling.

H. C. P.

Resolutions of the Southern California Section of the Pacific Coast Society of Orthodontists

WHEREAS it has come to the attention of the members of the Southern California section of the Pacific Coast Society of Orthodontists that individual practitioners of orthodontia are giving so-called courses of instruction of six weeks, more or less, such so-called courses being promoted either for personal profit or for the exploitation of certain patented appliances; and

WHEREAS such courses are ostensibly given to prepare dentists for orthodontic practice; and

WHEREAS such type of instruction is wholly inadequate to accomplish such purposes; and

WHEREAS such courses can appeal only to the ignorant or misinformed members of the dental profession; and

WHEREAS this type of individual, as a practitioner, is detrimental to the best interests of orthodontia and the high mission it represents in public health; and

WHEREAS such racketeering of so-called courses or patented appliances is not in harmony with the most modern thought in dental or orthodontic education, professional practice, or ethics; therefore, be it

Resolved That the Southern California section of the Pacific Coast Society of Orthodontists register its disapproval of such courses and racketeering practices; and further be it

Resolved That should such practices be indulged in by the members of the Southern California section of the Pacific Coast Society of Orthodontists, steps shall be taken immediately to terminate their membership in said society; and be it further

Resolved That the sentiments and principles recorded in this set of resolutions be immediately forwarded to all dental societies upon the Pacific Coast and to other orthodontic societies.

Resolved That the Southern California section of the Pacific Coast Society of Orthodontists indorse the reorganization of the American Society of Orthodontists on a national basis in which the recognized sectional societies become the component societies; and further be it

Resolved That our officers be instructed to forward this indorsement to the Board of Directors of the Pacific Coast Society of Orthodontists to confirm our sentiment; and further be it

Resolved That we request said officers and directors to canvass the other sections, and if the indorsement of all sections be obtained, that the officers of the Pacific Coast Society of Orthodontists then be empowered to amalgamate the Pacific Coast Society of Orthodontists as a sectional society of the American Society of Orthodontists.

NEWS AND NOTES

Southwestern Society of Orthodontists

The 1934 meeting of the Southwestern Society of Orthodontists will be held in Abilene, Texas, October 15, 16 and 17.

CURTIS W. WILLIAMS, *Secretary*
Medical Arts Building
Shreveport, La.

North Atlantic Orthodontic Society

A society has been organized and incorporated under the laws of the State of New York to be known as the North Atlantic Orthodontic Society. The aims and purposes are as follows:

(a) To encourage and foster the development of the study of orthodontia in the general practice of dentistry.
(b) To disseminate accurate information in all matters of interest to the association and the members thereof.
(c) To advance the science and art of orthodontia in all its phases.
(d) To promote friendlier intercourse between orthodontists and the members of the dental profession generally.
(e) To discourage the separation of orthodontia from the profession of dentistry.
(f) To encourage the contribution of the science and art of orthodontia in the interest of public health.
(g) To cooperate with dental organizations, societies and associations by lectures and meetings for the purpose of enhancing the progress of orthodontia.

The following officers have been elected:

DR. WILLIAM MCGILL BURNS, President.
DR. JAY M. CORNELL, Vice-President.
DR. JONAS SELVERSTONE, Treasurer.
DR. TALBOT H. LEBLANC, Secretary.

Mid-Southern Postgraduate Dental Clinic

The Mid-Southern Postgraduate Dental Clinic will convene in Memphis, October 22, 23, and 24, 1934.

Stuyvesant Polyclinic

There is a vacancy in the orthodontia staff of the Stuyvesant Polyclinic in New York. Applications may be sent to Dr. John Sage, 137-83 Northern Blvd., Flushing, Long Island, N. Y.

Notes of Interest

Dr. Harvey A. Stryker announces the opening of an office at 490 Post Street, San Francisco, Calif. Practice limited to orthodontia.

Dr. Oscar Jacobson announces the removal of his office to the Hotel Clifton, 127 West Seventy-Ninth Street, New York, N. Y. Practice limited to orthodontia.

Dr. B. Edwin Erikson announces the removal of his office from Chevy Chase, Maryland, to 3726 Connecticut Avenue, Washington, D. C. Practice limited to orthodontia.

Dr. Willis H. Murphey announces the opening of his office for the practice of orthodontia exclusively, 516 Medical Arts Building, Fort Worth, Texas.

Dr. Richard A. Smith announces the opening of an office at 636 Church Street, Evanston, Ill. Orthodontia exclusively.